DOCUMENT RESUME

ED 079 849 EA 005 324

AUTHOR	Rose, Clare; Trent, James W.
TITLE	An Analytical Review of Longitudinal and Related Studies as They Apply to the Educational Process. Research in Retrospect: Implications for the Future, Volume IV.
INSTITUTION	California Univ., Los Angeles. Center for the Study of Evaluation.
SPONS AGENCY	National Center for Educational Statistics (DHEW/OE), Washington, D.C.
PUB DATE	Dec 72
NOTE	343p.
EDRS PRICE	MF-$0.65 HC-$13.16
DESCRIPTORS	Child Development; Curriculum Evaluation; Educational Planning; Educational Policy; *Educational Research; Evaluation Methods; Followup Studies; *Higher Education; Learning Processes; *Longitudinal Studies; Program Evaluation; *Relevance (Education); Research Reviews (Publications); School Environment; *Student Development; Synthesis

ABSTRACT

This document is the fourth volume in a 5-part series that reports the results of a project undertaken to critically review and analyze major longitudinal studies of child and student development. These studies were conducted to discover the variables, techniques, methodologies, and problems pertinent to evaluation studies of the effects of schools and colleges on the growth and development of children and young adults. It was anticipated that study results would provide guidelines for the future research needed to enhance educational program planning, implementation, and evaluation. This volume contains the matrixes of findings and variables, synthesis and analysis of the findings and variables particularly as they pertain to the impact of the educational process on students. The syntheses of these findings are discussed within the framework of student and family characteristics, school and community environments, academic aptitudes and abilities, persistence, vocational interests and experiences, personality traits and motivation, and growth and development during college. The document concludes by suggesting implications of the research findings and recommendations for future research and educational policy. Related documents are EA 005 321-323 and EA 005 325. (Author/DN)

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AN ANALYTICAL REVIEW OF LONGITUDINAL AND RELATED STUDIES AS THEY APPLY TO THE EDUCATIONAL PROCESS

RESEARCH IN RETROSPECT:
IMPLICATIONS FOR THE FUTURE

Volume IV

by

Clare Rose and James W. Trent

December, 1972

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Portions of Chapter 3., particularly the section entitled "Sex", and portions of Chapter 9., "Growth and Development During College", appear in slightly altered form in Travers, R. M. (Ed.), Second Handbook of Research on Teaching, American Educational Research Association, Rand McNally (In press).

Portions of Chapter 8., "Personality Traits and Motivation", and portions of Chapter 10., "Summary, Implications and Recommendations", appeared in Trent, J.W., The Decision to Go to College: An Accumulative, Multivariate Process, Trends in Postsecondary Education, Washington, D.C.: U.S. Government Printing Office, 1970.

PREFACE

The present monograph is the fourth and last volume in the series of Analytical Review reports. Sponsored by the National Center for Educational Statistics of the U.S. Office of Education, the project was designed to critically review and analyze major longitudinal studies in order to discover variables, techniques, methodologies and problems pertinent to evaluative studies of the effects of schools and colleges on the growth and development of children and young adults. The analyses of educational impacts was undertaken in order to provide guidelines for the future research needed to enhance educational program planning, implementation and evaluation.

Volume I presented a preliminary review of some of the relevant issues suggested by the research under consideration. A beginning framework and set of criteria for the analysis, synthesis and evaluation were also presented in this volume.

Volume II contains the dynamics of the development of the abstracting process, the elements of the process, the typology of variables included in the research, an overview of the major issues suggested by the research as well as by the review process, and comprehensive abstracts of all of the studies reviewed.

Volume III describes the conceptual and methodological problems involved in research with particular emphasis on survey research. The dimensions of methodological evaluation, including statistical procedures and design, the logic of survey research, and the analysis of change are discussed in this report. An important part of this volume is the check-list of methodological criteria for evaluating research studies which emerged both from the intensive review of relevant literature and from the difficult task of evaluating the methodology of the Analytical Review studies.

The present volume contains the matrices of findings and variables, synthesis and analysis of the findings and variables particularly as they pertain to the impact of the educational process on students, implications of the research findings and recommendations for future research and educational policy.

The Analytical Review project involved the enormous and difficult task of sifting and re-sifting through research reports that varied in length from one volume to seven volumes of approximately 700 pages each. Several studies presented data collected over a 40 year period. In addition, a large body of literature relevant to each topic of concern to the project was examined. The amount of material that had to be reviewed was immense and was only made possible through the exceptional effort and cooperation of many dedicated individuals who participated in the project. Special appreciation is due Tallman Trask who contributed to the simulation discussion presented in Chapter 10. Judd Adams was instrumental in the development of the matrices and contributed exceptionally to the substantive development of the project.

James W. Trent
Principal Investigator

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Chapter 1.

INTRODUCTION

Under the auspices of the National Center for Educational Statistics of the U.S. Office of Education, the Analytical Review project of UCLA's Center for the Study of Evaluation undertook an intensive critical review and analysis of a select group of major educational research studies.

The specific objectives of the Analytical Review project were as follows:

1. To provide a comprehensive summary for each research study. The summaries are presented in elaborated abstract form. The components of the abstracts include a description of the major issues and objectives; research design, sample and sampling procedures; variables studied; measurements and instruments; statistical design and procedures; major findings; conclusions and recommendations.
2. To provide a critical appraisal of each study's major issues and objectives, assessing their relevance to educational research, their means of assessment and determination of their attainment.
3. To provide a critical appraisal of the research design of each study including assessment of its appropriateness to the stated objectives of the study and its contribution to the development of refined research strategies appropriate to the Longitudinal Study of Educational Effects. Specifically, this objective entailed an assessment of the conceptualization of the phenomena under investigation; choice and selection of appropriate samples; choice of statistical design; and implementation of the design.

4. To identify the instruments and measurements used in each study and assess their relative merit in terms of their reliability, validity, format, administrative feasibility, applicability to the stated objectives of the study and applicability to the Longitudinal Study of Educational Effects.
5. To critically assess the appropriateness of the statistical design and procedures relative to the stated objectives of the study and to identify those applicable to the proposed Longitudinal Study of Educational Effects. More specifically, the objective was to assess the appropriateness of the statistical models, the match between the statistical procedure and the data; problems in making inferences; problems in measuring change; and finally, to suggest more refined statistical procedures for measuring the impact of education on students.
6. To identify and critically assess the range of variables under investigation in order to determine which classes of variables have been adequately studied, those which need further study and which additional classes of variables ought to be studied.
7. To organize the major findings of each study, identify convergence and divergence of findings; organize them into models illustrating the interrelationship among the variables and identify those variables important in the prediction and understanding of student growth and development.

The first two objectives of the project were treated in Volume I and particularly Volume II of the project. Materials pertaining to objectives 3, 4, and 5, dealing with the studies' research designs and methodology, are presented in Volume III. Relatively little attention could be given the fourth objective concerning the instruments and measurements used in the studies, since it was discovered that this constituted another project in itself, exceeding the time and resources granted in the present project. This volume deals with the final two objectives of the project concerning the synthesis and relevance of the studies' findings. .

The first phase of the project was concerned with a descriptive review of a variety of studies with implications for the Office of Education's proposed developmental study, and with the development of data pools of particular use to such a study. The steps involved in this phase were as follows:

1. Selection of the studies: The opinions of a broad-based panel of experts were obtained to help identify major, relevant longitudinal studies. Studies selected for review were:

Astin, A.W., "Differential College Effects on the Motivation of Talented Students to Obtain the Ph.D.," Journal of Educational Psychology, 1963, 54, pp. 63-71.

Astin, A.W. and Panos, R., The Educational and Vocational Development of College Students. Washington, D.C.: American Council on Education, 1969.

Bachman, J.G., et al., Youth in Transition, Vol. I. Ann Arbor: University of Michigan, 1967.

Bachman, J.G., Youth in Transition, Vol. II. Ann Arbor: University of Michigan, 1970.

Coleman, J.S., Equality of Educational Opportunity. Department of Health, Education, and Welfare, Office of Education, Washington, D.C.: Government Printing Office, 1966.

Flanagan, John C., et al., Project Talent, Studies of the American High School, Monograph 2. University of Pittsburgh, Pittsburgh, Pennsylvania, 1962.

Flanagan, John C., et al., Project Talent, The American High School Student. University of Pittsburgh, Pittsburgh, Pennsylvania, 1964.

Shaycoft, Marion F., Project Talent, The High School Years: Growth in Cognitive Skills. American Institutes for Research and School of Education, University of Pittsburgh, Pittsburgh, Pennsylvania, 1967.*

Flanagan, John C., et al., Project Talent, Five Years After High School. American Institutes for Research and University of Pittsburgh, Pittsburgh, Pennsylvania, 1971.

Hilton, Thomas L., A Study of Intellectual Growth and Vocational Development, U.S. Department of Health, Education and Welfare, Office of Education, Bureau of Research, Final Report, Project No. 6-1830, March, 1971.

Husen, T. (Ed.), International Study of Achievement in Mathematics. New York: John Wiley, 1969.

Kagan, J. and Moss, H., Birth to Maturity: A Study in Psychological Development. New York: John Wiley, 1962.

Katz, J. et al. No Time for Youth. San Francisco: Jossey-Bass, 1968.

Lehmann, Irvin J. and Dressel, Paul L., Critical Thinking, Attitudes and Values in Higher Education. Michigan State University, East Lansing, Michigan, 1962.

Lehmann, Irvin J. and Dressel, Paul L., Changes in Critical Thinking Ability, Attitudes, and Values Associated with College Attendance. Michigan State University, East Lansing, Michigan, 1963.

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*For convenience, all of the Project TALENT volumes have been referenced in the synthesis under Flanagan, et al.

MacFarlane, Jean W., *Studies in Child Guidance*, Monographs of the Society for Research in Child Development, National Research Council, Washington, D.C., 1938.*

Newcomb, T.M., et al. *Persistance and Change: Bennington College and Its Students After 25 Years*. New York: John Wiley, 1967.

Super, D.E., et al. *Career Pattern Study: Monograph IV*. New York: Columbia University, 1967.

Thistlethwaite, D.L. *Effects of College Upon Student Aspirations*. U.S. Office of Education, Cooperative Research Project No. 0-098 , Nashville, Tennessee: Vanderbilt University, 1965.

Tillery, D., et al. *Project Scope--School to College: Opportunities For Post-secondary Education*. Berkeley: Center for Research and Development in Higher Education, University of California, in preparation.

Trent, J.W. and Medsker, L.L. *Beyond High School*. San Francisco: Jossey-Bass, 1968.

What follows in this report (the last volume of the series) pertaining to the last two objectives enumerated above, includes the following sections.

A description of the development of the conceptual model and matrices for organizing the findings and variables.

A synthesis and analysis of the findings particularly as they pertain to the impact of the educational process on students.

Implications of the research findings, and recommendations for future research and educational policy based on an analysis of the composite of research findings.

The matrices of variables and findings.

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* In addition to the studies originally selected, several sub-studies based on the Berkeley growth sample studied by MacFarlane were also consulted (e.g. see citations listed on p. 248, Vol. II) all of which have now been incoporated in *The Course of Human Development*. Editors: M.C. Jones, N. Bayley, J.W. MacFarlane and M.P. Honzik. Selected papers from the Longitudinal Study, Institute of Educational Development, University of California, Berkeley, Xerox College Publishing, 1971. All of the findings from the Berkeley Growth studies reported in this volume have been referenced under Jones, et al.

The word "critical" is used in the above objectives advisedly for it emphasizes the most important aspect of the project. Throughout the project, an attempt has been made to carefully and rigorously scrutinize each study in terms of the scientific soundness of its methodology, the validity, reliability and appropriateness of its measurements and survey instruments, and finally, the validity and credibility of its findings. Although we examined the internal validity of each study, we also considered interstudy consistency, that is, the findings' credibility in light of the accumulated results.

The project did not constitute a traditional "review of the research." Rather, it represents a unique attempt to make a systematic holistic evaluative assessment of research findings as they relate to educational effectiveness.

In order to accomplish the two objectives stated in the introduction, a conceptual framework consisting of a comprehensive General Educational Development model and accompanying matrices were developed in which both the variables and findings could be organized and analyzed. The matrices of findings and variables are both presented in the appendix to this volume. Although separate matrices were developed for the variables and for the findings, it became apparent that a discussion of which classes of variables had been adequately studied and which needed further study was inextricably tied to the analysis and synthesis of the findings.

It also became apparent that a synthesis of research findings is a multi-stage process. It is not simply a process of arraying vast numbers of findings and gathering together the convergent and divergent information. Rather, it is a process that must include a systematic organization of the findings; an analysis of the findings in terms of the methodological soundness of the study from which they were derived; interstudy consistency, the relationship between the findings and the accumulated body of knowledge; and finally, the relationship of the findings to the stated objectives of the total educational system.

The process was extremely time-consuming and tedious. After the studies were read, and notes taken pertaining to each of the elements of the abstract (the abstracting process is described in Volume II, part 1), supplemental literature relevant to methodology and developmental theory was examined. Preliminary conceptual frameworks were then developed for both the methodological evaluation (presented in Volume III) and for organizing the variables and the findings.

As the project progressed and each stage in the process was developed, new questions were raised and new problems posed. Each stage in the developmental process of the project, specifically, the abstracting process, the development of the models and matrices for analysing the variables and synthesizing the findings became increasingly complex and difficult. Because of this complexity, the development of these components were parallel endeavors. That is, each component was conceptualized, developed, analyzed, revised, and refined as separate units of the project, the results of which are presented in the project's four volumes.

As indicated previously, the present volume primarily focuses on the General Educational Development model which reflects the accumulative, interrelated and interacting multidimensional process involved in students' progression through school and college. This model, as presently conceived and developed, however, remains to be tested; the synthesis of findings contained in this report is tentative. Instead of answering critical questions, old assumptions were challenged and new hypotheses were posed. For example, although it is clear that early background factors contribute to an understanding of a person's personal, educational, intellectual and vocational development, is it the same set of early background factors that contribute to each of these lines of development? Or, are the sets of background factors that contribute to vocational development different from the background factors that contribute to personal or intellectual growth and development? Although certainly much of the information gleaned from this synthesis may well prove to be viable and enlightening, the findings have not yet been rigorously scrutinized in terms of all of the methodological criteria of evaluation described in Volume III. Such a task remains as another project in itself.

Chapter 2.

DEVELOPMENT OF THE MATRICES AND MODELS

The need for a comprehensive conceptual framework which would incorporate the vast number of variables and findings led to the conceptualization of four "models" with accompanying matrices for both the variables and the findings. These models were developed to provide basically conceptual guidelines with corresponding graphic illustrations for organizing classes of variables according to previously determined or hypothesized relationships. In this case, the relationships consisted of classes of independent and dependent variables. An overview of the classification matrix for personalogical variables is presented in Figure 1. An overview of the matrix for organizing the findings by the models is presented in Figure 2.

Although not all of the studies did so explicitly, the variables, and the findings, were classified by the staff as independent or predictor variables, and dependent or criterion variables. In some studies, Kagan and Moss (1963), for example, the same sets of variables were both independent and dependent; the authors were examining the stability of the variables over time. In other cases, a given variable was a dependent variable in one study and an independent variable in another. For example, persistence in college was a dependent variable in Trent and Medsker's (1968) study and an independent variable in Newcomb's (1967) study.

Thus, for every study, it was possible to generate a matrix of variables and of findings to discover relationships between and among variables. The matrix thus generated facilitated visual representation of the sought for relationships in the study. Although many of the studies

DIMENSIONS	Needs-Motives-Interests	Attitudes-Values-Feelings-Beliefs	Awareness Knowledge Understanding	Abilities Skills Behavior	Achievement	Satisfaction and Opportunities
Personal/ Interpersonal						
Social/ Political						
Spiritual/ Religious/ Humanistic						
Cultural/ Aesthetic						
Cognitive/ Intellectual						
Vocational/ Economic						

Figure 1. Overview of Classification Matrix for Personal Development

	MODELS OF THE DEVELOPMENTAL PROCESS			
INDEPENDENT VARIABLES	Model I-Personal Development	Model II-Cognitive Development	Model III-Vocational Development	Model IV-Educational Development
PERSONAL VARIABLES 1. Personal-interpersonal 2. Social-political 3. Cultural-aesthetic 4. Spiritual-religious-humanistic 5. Cognitive 6. Vocational				
FAMILY ENVIRONMENT VARIABLES A. Demographic 1. Socioeconomic status (SES) 2. Place of parents' birth 3. Educational level of parents 4. Size of family B. Process 1. Psychological environment of home 2. Philosophy of education in home 3. Financial support				
SCHOOL ENVIRONMENT VARIABLES A. Demographic - high school 1. Type of high school				

Figure 2. Matrix for Organizing the Findings by the Models - An Overview

INDEPENDENT VARIABLES	Model I-Personal Development	Model II Cognitive Development	Model III-Vocational Development	Model IV-Educational Development
SCHOOL ENVIRONMENT VARIABLES (cont.)				
2. Size of school and classes				
3. Composition of student body				
4. Curricula				
5. Physical resources-finances				
C. College vs. no college				
D. Demographic - college				
1. Type of college				
2. Size of college and classes				
3. Composition of student body				
4. Physical resources-finances				
5. Curricula-majors				
E. Process - College				
1. Influence of teachers - faculty characteristics				
2. Influence of peers				
3. Academic and non-academic experiences				
4. Persistence/withdrawals				
COMMUNITY ENVIRONMENT VARIABLES				
1. Regional				
2. Community - rural/urban				

Figure 2. (continued)

were not conceptualized in terms of independent and dependent variables, an understanding of the relationships among the variables under investigation would be facilitated if future research studies would be considered in this manner.

The matrices generated were inextricably part of the abstracting process, for some of the difficulties encountered in this process were also encountered in the development of the matrices. A major problem was determining which of all the multitudinous findings should be reported. Some of the findings were clearly not relevant to the Office of Education's Longitudinal Study of Educational Effects assessing the impact of schools on student development. Other findings appeared to be too specific to a narrowly defined population; still others had too low a level of association with any of the dependent variables. In the final analysis, the criteria used for selection of findings included in the matrices were: (1) relevance to the Office of Education's Longitudinal Study of Educational Effects; (2) contribution to a developmental theory of human growth, and (3) generalizability to or implications for a wide population of individuals.

The four models selected at the initial stage of the project were:

1. Educational Development: patterns of educational flow, that is, the description of who does and does not progress through high school and attend institutions of higher education, why, and on the basis of what sequence of decisions;
2. Personal Development: social-psychological development, including the acquisition of orientations, attitudes, values, and beliefs which may promote or be a consequence of students' responsiveness to educational programs and environments;

3. Cognitive-Intellectual Development: the growth of intellectual capabilities and skills during preschool and elementary school years which serve to provide a basic foundation for success at the high school, college and postcollege levels; and
4. Vocational Development: the development of perceptions and values and the sequence of decision-making points leading to different vocational plans and pursuits.

The intent of these models was to formulate a single, major set of propositions by incorporating the relevant key variables; elaborating these propositions by specifying important interactions, including interactions among the models; and specifying multidirectional relationships between all selected variables.

After an examination of relevant literature, it was decided that the organization of matrices developed for the variables and the findings should be based upon the six categories of basic human values, attitudes and interests derived from the Allport-Vernon-Lindzey Study of Values (1951) which, in turn, were based on Spranger's (1928) theory of personality types. These categories described in terms of "types of men", are as follows:

1. Theoretical: The dominant value of the theoretical man is the discovery of truth and knowledge. His interests are empirical, critical, and rational.
2. Economic: The economic man values what is useful and practical, particularly the affairs of the business world.

3. Aesthetic: The aesthetic man values beauty, form and harmony. His chief interest is the artistic facets of life.
4. Social: The highest value for the social man is other human beings.
5. Political: The political man values power and influence, leadership and competition.
6. Religious: The religious man is mystical. He values unity and seeks to comprehend the cosmos as a whole and to relate himself to its totality.

Several modifications and additions to the Allport-Vernon-Lindzey categories were made, however. For example, the Personal Development matrix is divided into general categories of independent variables entitled Personal-Interpersonal: Social-Political: Cultural-Aesthetic; Spiritual-Religious-Humanistic; Cognitive; and Vocational. Each of these general categories includes several specific variables pertaining to the broad category. For example, the Personal-Interpersonal category includes the following variables: sex, race, academic aptitude, early childhood behaviors, age, personality characteristics and dispositions, psychological adjustment and educational aspirations, motivations and interests.

Other modifications of the Allport-Vernon-Lindzey categories included the expansion of the Theoretical category into the separate and more comprehensive Cognitive-Intellectual Development matrix and expansion of the Economic category into the Vocational Development matrix.

Several classes of variables dealing with environmental factors, e.g., family, peers, and community were also applicable to each of the four developmental models described above. Additional matrix categories were therefore generated to deal with these factors. The Environmental category is divided into three basic sections: Family Environment, School Environment, and Community Environment. School environment is divided into high school and college environment. Each of these categories is further divided into demographic variables and process and press variables. For both high school and college, demographic variables include type of school; size of school and size of class; composition of student body; physical resources and finances of the school; and curriculum. The process and press variables include the influence of teachers, and peers; academic and non-academic experiences; and persistence and withdrawal.

The conceptual framework employed for the variables was adapted for the findings and presentation of the matrices of the findings is also organized according to the four original models described above. For the findings, too, each of the four matrices is divided vertically into the four main classes of independent variables; those related to personal characteristics; family environmental factors, school environment and community environmental factors.

The classification of dependent variables displayed horizontally on the matrices of variables and findings, consists of the following broad categories: Needs-Motives-Interests; Attitudes-Values-Feelings-Beliefs; Awareness-Knowledge-Understanding; Abilities-Skills-Behaviors; Achievement; and Satisfaction and Opportunities.

Clearly, there is much overlap between the categories and in many cases the decision concerning the placement of a particular variable or finding was difficult. A comprehensive cross-referencing system, however, would have made the matrices too complicated and too difficult to read.

Therefore, it was decided that in order to compensate for the overlap and yet keep the matrices as easy to read as possible, a moderate cross-referencing system both among and between the matrices would be used when particularly difficult and possibly arbitrary decisions had to be made. For example, critical thinking, as defined in Lehmann and Dressel's (1963) study, is classified both as an attitude and also as an ability in the Cognitive-Intellectual matrix.

Each group of dependent variables and each class of independent variables are presented in each of the four matrices even though, in many cases, there are no specific findings derived from the studies reviewed pertaining to a particular class of variables. The objective of the matrix approach to synthesis, however, was not only to array the available findings in order to identify both convergence and divergence of the findings but also to locate the gaps in the research. That is, to isolate the areas which have not been sufficiently researched and where generalizable findings are not available. In this manner, it was possible to indicate areas in which sufficient information is available, and areas which need further research.

As work proceeded on the theoretical development of the models, however, it became increasingly apparent that the Educational Development Model overlapped to a considerable degree each of the other models. Cognitive growth could not be considered entirely separate from personal growth. Performance in school and educational opportunities and experiences were critical variables contributing to an individual's intellectual, personal, and vocational development. Similarly, vocational development was closely related to both personal and educational development. For example, Super

(1953) conceives of his career model of vocational development as one in which the individual moves along one of a number of possible pathways through the educational system, into, and through the work system. The individual's starting point, however, is his socioeconomic status; the speed at which he moves along the continuum is fixed by his psychological and social characteristics and by the resources provided by his family environment. Self-concept, identification with others, curricular choices, intelligence, educational and vocational aspirations, expectations, interest, values, and attitudes are critical variables contributing in varying degree to the individual's vocational maturity and development.

Psychologists, working on developmental models of cognitive-intellectual growth, also start their patterns of growth with the individual's family background, socioeconomic status and psychological environment of the home, continuing through early childhood personal and educational experiences, educational opportunities and experiences, interacting with the classes of variables pertaining to self-concept, educational aspirations, expectations, intellectual interests, activities, values, and social reinforcement.

A General Educational Development Model emerged, therefore, designed to encompass critical overlapping and interacting elements of the other four models. This comprehensive model is based on the view of the individual as a "whole" person and the assumption that the specific areas of growth and development, i.e., personal, educational, cognitive-intellectual, and vocational, are mutually interdependent branches of a general developmental model incorporating many of the same sets of variables. A review of the literature pertinent to these specific areas of development supported this assumption. (See, e.g., Kroll, 1970; Perry, 1968; Super, 1953.) Although leading theorists in vocational development theory, intellectual theory, and personal development theory continue to, and certainly should continue to develop theories and models specific to their area of interest, apparently many elements of their theories and models follow the same lines of development and start with similar sets of variables and hypotheses.

As indicated above, parental socioeconomic status is a primary starting point of an individual's development and one of its major determinants. The psychological environment of the home is another major determinant of growth. Intelligence is clearly related to an individual's personal, intellectual, and vocational status. But other variables also determine the individual's movement through life, and these variables interact as the attainment of one stage of development influences movement toward and attainment of the next stage. The exact magnitude of the predictive ability of each of these variables as they contribute to development and the specification and interpretation of the interrelationship of student x process x environment as they pertain to vocational, personal, and intellectual development must be implemented more widely and more thoroughly.

For the purpose of this report, which is primarly concerned with the role played by education in the development of young people, the heuristic device of a General Educational Development Model with branches pertaining to cognitive-intellectual, personal, and vocational development will be sufficient. The focus of this report, then, concerns the synthesis of

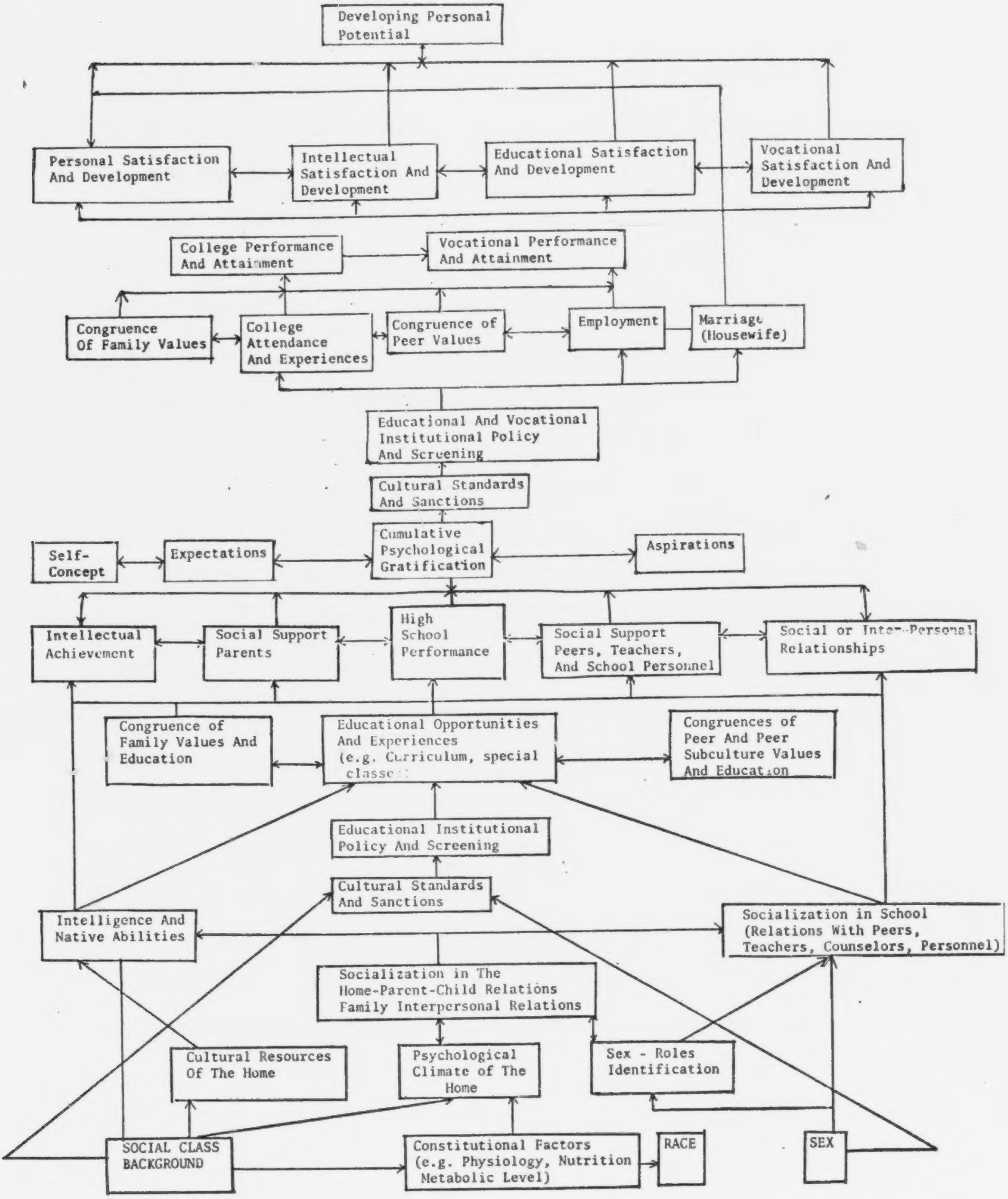
Developing Personal Potential
Personal Satisfaction And Development
Intellectual Satisfaction And Development
Educational Satisfaction And Development
Vocational Satisfaction And Development
College Performance And Attainment
Vocational Performance And Attainment
Congruence Of Family Values
College Attendance And Experiences
Congruence of Peer Values
Employment
Marriage (Housewife)
Educational And Vocational Institutional Policy And Screening
Cultural Standards And Sanctions
Self-Concept
Expectations
Cumulative Psychological Gratification
Aspirations
Intellectual Achievement
Social Support Parents
High School Performance
Social Support Peers, Teachers, And School Personnel
Social or Inter-Personal Relationships
Congruence of Family Values And Education
Educational Opportunities And Experiences (e.g. Curriculum, special classes)
Congruences of Peer And Peer Subculture Values And Education
Educational Institutional Policy And Screening
Cultural Standards And Sanctions
Intelligence And Native Abilities
Socialization in School (Relations With Peers, Teachers, Counselors, Personnel)
Socialization in The Home-Parent-Child Relations Family Interpersonal Relations
Cultural Resources Of The Home
Psychological Climate of The Home
Sex - Roles Identification
SOCIAL CLASS BACKGROUND
Constitutional Factors (e.g. Physiology, Nutrition Metabolic Level)
RACE
SEX

Figure 3. General Educational Development Model

findings as they pertain to and illustrate the basic classes of variables upon which the general model has been developed.

The General Educational Development Model

As described in Volume I of the Analytical Review project, the educational development model presented in Figure 3 provides a framework for answering several questions posed by educators and researchers over the last decade. Why do some high school graduates continue their education in institutions of higher learning, while others enter the work force immediately and permanently? Why do some students postpone a higher education for several years? Among those who continue their education, what influences their selection of a particular institution? What kinds of formal or informal educational experiences promote or facilitate students' responsiveness to education and inculcate in them positive attitudes toward education thus increasing the likelihood that they will continue their education? And finally, can the educational system mediate and modify the individual's pattern of growth and development established in the early childhood years?

Three key classes or sets of variables were posited:

1. Background factors: the pre-high school socioeconomic, educational, and general environmental background of students which differentiates among their values and attitudes toward life and education. Background factors include academic aptitude, socioeconomic status (SES), sex, race, the socioeconomic and other environmental characteristics of the

communities and neighborhoods in which the students reside, and most particularly the educational background, related values of parents and the general family environment.

2. High school performance: including all of the criteria assessed by college admission committees (grades, standardized test scores, conduct, extracurricular activities, leadership, honors) as well as characterological factors related to "maturity".
3. High school educational opportunities and experiences: these opportunities range from school facilities and curriculum to faculty characteristics, classroom techniques, and identification and association with peers and peer subcultures.

These three complex sets of variables cannot be merely temporally defined in their relationship to the dependent variables - entrance and persistence in college. As Trent and Medsker and others have demonstrated, many students who perform well in high school do not go to college. Moreover, even greater proportions of bright students who have enjoyed superior educational opportunities fail to perform well in high school and to attend college. Clearly, intervening variables which mediate and interact with the classes of variables outlined above must also be examined.

Two such intervening variables were posited - aspirations and expectations. Although aspirations and expectations may either precede, coincide with, or follow high school performance, they form a pervasive psychological construct. It was hypothesized, in developing the comprehensive model, that emerging aspirations and expectations would stimulate an awareness in the student of the relationship between performance in high school and college attendance. At the same time, separate from or in conjunction with the influence of parents, the high school experience which tests students' performance might be expected to influence and modify the students' aspirations and expectations. In addition, aspirations and expectations may be quite independent constructs whereby aspirations may exceed, match, or underplay expectations.

Rather than simply describing the relationship between high school performance and college attendance, then, it was at least minimally necessary to speak in terms of a complex interaction of high school performance, aspirations, and expectations with their consequent impacts on college attendance and persistence.

It is not difficult to see, at this point, the interaction of these mediating variables with the variables pertinent to students' personal and vocational development. Clearly, the factors which contribute to the student's decision to enter college also contribute to the student's other alternatives, that of entering employment or of postponing higher education until some later date. Moreover, if the high school experiences, including the emphasis on performance criteria, modify and mediate a student's aspirations and expectations, they must also modify and mediate the student's self-concept, and thereby his personal, intellectual and vocational development.

Constitutional factors, particularly sex and intelligence are also important variables in understanding students' growth and development. Just as the social class system stratifies opportunities and motivations, sex-role differences have been and continue to be an important source of stratification. Women's liberation has highlighted the problem of "socialized oppression", yet the revolution in male and female attitudes toward sex-roles seems to be moving more along ideological lines among urban intellectuals than in broad-based legislation pressured by mass public support. Thus, girls continue to be differentiated from boys in terms of "acceptable" social rules and coincidentally in terms of "appropriate" social and educational opportunities and experiences. Such societal differentiation of sex roles appears early in the child's development, (see e.g. Kagan and Moss, 1962) and continues to alter and shape the development of sex-role behavior throughout adulthood. The impact of social sex-role differentiation and social ostracism on both females and minority students' intellectual, personal, vocational, and educational development doubtless is delimiting in many ways.

The foregoing discussion outlines the rationale for the development of the comprehensive General Educational Development Model. Ideally, then, a synthesis of the findings from these diverse studies, arranged in temporal order, would yield information concerning the relative contribution each of these sets of variables makes to the growth and development of young people, and the impact of the various levels of the educational system upon this development. In this regard, the synthesis of findings is disappointing. We can say with some degree of scientific certainty that, as postulated previously, certain classes of variables are related to and influence certain aspects of students' growth and development. Unfortunately, however, as indicated in Volume III, the specification and explication of these findings have generally not been undertaken by any of the studies under review in such a way that the differential relevance of the findings in the present context could be determined with any accuracy. As a matter of fact, as is normal in the scientific process, more questions have been raised than answers provided. Moreover, there remains a lack of knowledge concerning what kinds of educational policies and practices have what effects on what kinds of students in what kinds of schools.

Mention should also be made, again, that the General Educational Development Model remains to be tested beyond the synthesis of findings in this report. Models convey minimal information; their greater value is their suggestion of relationships. An examination of the literature is needed to verify the presence of relationships, describe the nature of the relationships (e.g. linear or curvilinear), describe the magnitude of the relationships and describe the factors influencing the magnitudes of the relationships. Much more rigorous and comprehensive research needs to be done before there will be information sufficient enough to describe properly these relationships.

Chapter 3.

STUDENT AND FAMILY CHARACTERISTICS

An examination of the studies reviewed by the Analytical Review project, as well as numerous supporting studies also cited in this report, reveals considerable evidence that non-school factors may be more important determinants of educational outcomes than school factors. These non-school factors include a host of motivational factors related to early childhood pre-school experiences as well as constitutional factors such as intelligence, race and sex.

Sex

The current as well as the historical existence of discrimination against women in the labor force and in the educational process has been well documented. Ever since Betty Frieden's (1963) treatise on the feminine mystique, a proliferation of books, research studies, journals, and magazine articles have been devoted to the study of women and particularly to the cultural stereotypic image of women which perceives them as passive and subordinate. At the same time, armed with this increasing body of damaging evidence, the Women's Liberation movement has attempted to change the cultural definition of women's role in society. Non-discriminatory legislation has been passed by Congress; a woman ran for Democratic presidential candidate of the United States. Yet, the impact of the educational process, a potentially powerful source of influence on the lives of young women, seems to be negligible.

In 1963, 24 million women were employed, representing over one-third of the labor force and proportionately more women are entering employment today. Moreover, many of these women, particularly those who have completed college do not have to work for financial reasons but are motivated to work instead because of their career interests and need for self-fulfillment. Mary D. Keyserling (1967), Director of the Women's Bureau, U.S. Department of Labor, reported a study made by the Women's Bureau of the activities of the alumnae class of 1945, fifteen years after graduation. One-third of the group was employed; five out of six of the remaining two-thirds indicated an interest in future employment. She also reported a 1957 study of women graduates seven years after graduation which revealed that over half of the women were employed.

One implication to be drawn from Keyserling's paper is that a very large proportion of women college graduates are actively pursuing careers, or at least some type of employment. This situation leaves major questions unanswered, however. That is, to what extent do women's college experiences contribute to the attainment of satisfying careers and life-styles? To what extent does the pre-college educational system facilitate and stimulate women's desire to enroll in college? The review of the literature suggests an even more basic question: to what extent must our entire eudcational system act as a counterforce to societal and parental pressures which restrict women's development?

For many years, psychiatrists and psychologists have stressed the importance of early childhood experiences in the development of behavior patterns and attitudes that, in turn, influence adult behavior, attitudes, and outcomes. Only recently, however, have psychologists become more attentive to sex-linked differences in these early childhood behaviors and to the differential impact of both early childhood family and school experiences on the sexes. Not only are sex differences manifest in early childhood abilities and behaviors but these early childhood sex-linked behaviors are also predictors of similar adult behaviors (Jones, et al, 1971; Kagan and Moss, 1963).

Moreover, the way in which the mother's behavior or the way the mother responds to the child during the early years of his or her life influences and to a great extent determines his or her life-long characteristics and behaviors. For example, Kagan and Moss found that boys who were overly protected by their mothers during ages 0-3 became passive, intellectually-oriented, and had non-masculine sex-role interests. At the same time, males' passivity and the avoidance of traditional masculine behavior before age 6, was related to conformity to parents and a consistent cluster of school behaviors such as avoidance of dangerous activity, an absence of verbal and physical aggression, timidity in social situations, and fear of aggression, bodily harm and body-contact games. These passive boys were consistently non-competitive, suffered peer rejection and withdrew into more solitary intellectual activities. As adolescents and adults, they experienced sexual anxiety and became increasingly involved in academic studies and intellectual interests.

Intellectual, achievement-oriented girls, on the other hand, were fearless, independent, and competitive. The maternal behaviors that correlated with female achievement, moreover, were quite different from those related to boys' achievement. Mother's hostility, not protection, during ages 0-3, together with the demand for achievement and high standards during ages 10-14, were associated with adult female intellectual achievement. Evidently, both the intellectually-oriented males and females tend not to adopt traditionally-defined American sex roles.

Jones, et al (1971), found that although there was no sex difference in the IQ's or mental growth rates of young children, early maternal practices differentially influence the IQ scores of boys and girls. Boys whose mothers were "loving" when they were age 1 had comparatively low IQ test scores while boys whose mothers were hostile and rejecting had comparatively high scores. Between ages 5 and 18, however, boys with loving mothers had higher IQ scores than those with hostile mothers, and closeness of the mother-son relationship was most predictive of males' IQ test performance between the ages of 8 and 18. Females showed opposite correlations, and if the mother-daughter relationship was too close, the daughter's intelligence decelerated in later childhood. It should be noted, however, that "closeness" was not operationally defined by Jones and associates, nor was "protection" defined by Kagan and Moss.

Jones, et al (1971) also found that individual differences in mental abilities become stabilized earlier in females than in males. Although the IQ's of both sexes were fairly stable by age 6, continuing to grow through age 36, females' IQ scores were relatively less stable after age 16. At the same time, although females ability tended to resemble that of their parents at an earlier age than males, there was an increase in the growth of the parent-son resemblance through ages 14-15, suggesting a maturing of mental functions in males until adolescence. The implication here seems to be that girls' mental functions mature earlier than boys', but their development is less consistent after age 16. The question of why girls' IQ become more unstable after age 16 must be raised and the finding pertaining to maternal practices may provide the answer.

Berelson and Steiner's (1964) review of behavioral science literature presents substantial evidence that opinions, attitudes, and beliefs are "inherited from parents"; they are learned in early childhood and persist into adulthood. Certainly parents are the first significant influence in the individual's life, and as "significant others", determine more than anyone else the individual's self-perception, including his conception of his position in society and the role he is to play in that position (Trent, 1970a). Although Bronfenbrenner (1961) found that parents make significantly less demands of girls than they do of boys, apparently girls more than boys are anxious to please their parents.

Research has also shown that parents and adults in general exert greater influence over girls than boys (Crandall, 1964), and that family attitudes and social relationships are fully developed for women by grade nine and persist unchanged to college-age (Berdie, 1968). Cross (1963) found on the basis of a synthesis of four research studies that 55% of the females compared to 39% of the males said it was "very important" to satisfy their parents' wishes. These findings gain in relevance in view of the fact that parental encouragement has been found to be a key variable distinguishing between those who go to college and those who do not. At the same time, according to students' self-reports, parents expect their sons to get more education than their daughters. Thus parental encouragement for education is greater for boys than girls particularly among the lower socioeconomic groups (Tillery, et al, 1972; Trent and Medsker, 1968). The implication of these findings suggests that perhaps parents are reinforcing the traditional sex stereotypes and the "college is for men" attitude may, as a result, affect females achievement behavior as well as their role-orientation and educational and vocational aspirations.

Apparently, schools further contribute to this situation. Boys are more encouraged to enroll in mathematics and science courses and in many schools they must enroll in one of several vocational shops; girls are frequently not given the choice to enroll in these shops but rather are obliged to enroll in such courses as home economics instead. It is not surprising, then, that traditionally males have demonstrated superior ability in mathematics while girls excel in verbal ability as demonstrated by Project TALENT's findings (Flanagan, et al, 1964). Although males made significantly larger gains on aptitude tests of reasoning, visualization in three dimensions, abstract reasoning, electricity, and electronics, girls made significantly larger gains than males in literature information, memory for words, verbal skills and home eocnomics. According to Flanagan and associates, however, most of the sex differences found in these patterns of information reflected differences in interest. Of course, there is probably a link between intrinsic ability and interest in a subject; for example, Husen (1969) found that the level of interest or motivation to excel in mathematics was greater among high school males than females. It is questionable, however, whether females really have genetically determined interests in literature, words, and home economics and genetically determined lack of interest in mathematics, abstract reasoning, mechanics, and sports.

In fact, although the mathematics scores, both verbal and computational, of high school males were consistently superior to females (Flanagan, et al, 1964; Husen, 1969), the mathematics performance of girls attending non-coeducation institutions was considerably higher than those attending coeducational schools (Husen, 1969). One implication of this finding may be that girls perform better when they do not have to compete with boys. Another may be that personnel in girls' schools are used to dealing only with girls and the absence of boys prevents them from dealing with stereotypic comparisons between the sexes that may lead to discrimination of the girls.

Girls are rewarded for being passive and well-behaved; boys are expected to be more aggressive and noisy, and they both behave very much according to expectations. In fact, high school girls, including those who do not go to college, have been found to be considerably more involved in their academic work than are boys over the four-year period of high school. They are better behaved, better mannered, more social, and take their school assignments more seriously. In addition, they have significantly higher grade point averages (Flanagan, et al, 1964; Jones, et al, 1971; Tillery, et al, 1972a). This achievement differential continues in college; according to Cross'(1963) review, 43% of the women and only 30% of the college men graduated in the top 10% of their high school classes.

Yet, by grade 12, females tend to relinquish earlier plans for college and careers, plans which might retard marriage. At grade 12, 15% of the non-attending females reported they were attracted to "creative" occupations, but only 3.8% anticipated that they would pursue such occupations (Tillery, et al, 1972b). Moreover, despite the fact that females earned better high school grades than males, only 26% of the females compared to 35% of the males felt they had the ability to go to college. The only areas in which females rated themselves higher than males were the social and esthetic dimensions of "cheerfulness" and artistic ability (Cross, 1963).

Findings from Project TALENT indicated that more high school males expected to enter engineering than any other profession; the largest percentage of girls expected to become secretaries, typists and office clerks. Several questions come to mind at this point. Why are girls relinquishing these higher ambitions? Why are they in such numbers, expecting to become secretaries and typists rather than lawyers, engineers, and doctors? Clearly, the socialization process affects females' self-concepts and, thereby, their behaviors.

A series of studies on adolescence reported by Douvan and Adelson (1966) noted a sex variation in the nature of the adolescent identity crisis.

The identity issue for the boys was primarily a question of occupational-vocational choice; self-definition for girls depended directly and entirely on marriage. Thus, girls are pressured by the societal norm which has idealized for them the roles of wife and motherhood. If marriage is the key to identity, it is no wonder that girls will not participate in any activity which might be perceived as a barrier to marriage. Apparently, the pressure of "kinder, kuche, kirche" (children, kitchen, and church) is still great for many girls.

Lavin (1965) found, for example, that girls with high grades were rated by the same sex peers as being less acceptable to boys than girls with low grades. Brown (1959) showed that high achievers were low in social peer group-oriented activity and interviews conducted by Ross (mimeo) indicated that high school girls who were achievement-oriented avoided potential peer group rejection by keeping their abilities hidden. These findings corroborate the implications discussed earlier regarding the superior mathematics performance of girls attending non-coeducational schools. Thus, women who do choose college and the postponement of marriage must deviate from societal expectations and suffer the associated stigma while women who do not go to college exhibit established norms and marry soon after completing high school. Trent and Medsker (1968) found that nationally, 62% of the women who did not go to college were married within three years after high school graduation. Another 14% were engaged or going steady.

It should be noted, that although more girls than boys discussed their career plans with high school counselors, high school girls more than boys reported dissatisfaction with their counselors (Tillery, et al, 1972b).

It is possible that counselors, albeit unintentionally, are not encouraging girls to develop their potential. Surveys across the country and within individual communities provide ample evidence that students do not as a rule perceive their teachers and especially their counselors as very helpful regarding their educational and vocational decisions and activities (Delavan, 1966; Flanagen, et al, 1964; Tillery et al, 1972b; Trent and Medsker, 1968).

In spite of the potential of women, few expect to or are encouraged by school personnel to enter stereotypically masculine careers. The evidence is that this lack of encouragement is true even among counselors, who, by nature of their role and training might be expected to be most open to women's fullest exploration of their educational and vocational potential. Karman (1972) found that college women with "non-traditional" career aspirations had requested assistance with vocational plans from counselors significantly less than women of the traditional career group. Thomas (1967) studied the reactions of male and female counselors to college women who had "traditional" feminine career goals and those holding "non-traditional" career goals. He observed that all, but particularly male counselors, perceived the traditional feminine goals as more appropriate for women.

It is not surprising, then, in light of these findings, that females are less prone than males to go to college and/or choose occupations of a professional nature (Astin, 1963; Astin and Panos, 1969, Flanagan, et al, 1964; Tillery, et al, 1972b; Thistlethwaite, 1965; Trent and Medsker, 1968).

In 1962, more women than men graduated from high school - 872,000 men and 966,000 women. At high school graduation, 67% of the females and only 45% of the males had a "B" average or better. However, women constituted only 42% of the 1962 college enrollment. Of the brightest 40% of high school students, only one-half went to college; of the half who did not go, two-thirds were women (Cross, 1963; Epstein, 1970).

Probably as a result of the combined influence of parents and school personnel, girls do not view college as essential. In Cross' study (1963) 94% of the college men and 83% of the college women felt that college was "very important" for a man. Only 50% of the women and 25% of the men indicated that college was equally important for women. Similar results were obtained by Trent and Medsker (1968). In addition, in their sample 51% of the female persisters, 7% of the female non-attenders, 21% of female withdrawals saw college as equally important to a woman as to a man. Although one might expect that male persisters would consider college important for women, they too reflected the traditional viewpoint - less than one-fourth of them considered college for women as "very important."

Once enrolled in college, however, females are more likely to graduate (Astin and Panos, 1969; Flanagan, et al, 1964; Tillery, et al, 1972b; Trent and Medsker, 1968). But, although a greater proportion of females than males obtained a college degree within four years after college entrance, when females' superior academic achievement records were taken into account, they were more likely than males to withdraw from college (Astin and Panos, 1969; Trent and Medsker, 1968).

Once in college, sex is a dominant predictor of students' final major field and career choice--college men moving toward traditionally-defined "masculine" majors and careers; women toward more "feminine" careers and majors (Astin, 1963; Astin and Panos, 1969; Karman, 1972). Women indicate preferences for careers in nursing, teaching, and business (Bruemmer, 1969; Trent and Medsker, 1968). In general, women have negative feelings about jobs requiring assertive or competitive characteristics, particularly where the competition is with men (Wright, 1967; Epstein, 1970). Of the 1,646 women upperclassmen surveyed nationally by UCLA's Center for the Study of Evaluation, only 108 (or 6.6%) expressed career aspirations in non-traditional fields; 1,537 aspired to careers in occupational fields where women represent the large majority of the work force (Karman, 1972).

Moreover, throughout the college years, the conflict between the drive for academic achievement and the pressure to conform to traditional feminine role behavior continues. For example, according to Katz and associates (1968), the relative importance of "husband-hunting" increases in direct proportion to the closeness of graduation. In addition, many career-oriented women change their preference away from male dominated careers (Schwartz, 1969), or they seek feminine specialities within these fields (Bruemmer, 1969). Unfortunately in fact, two studies found that college women deliberately prostitute their achievements in order to increase their appeal to men. These studies revealed that 40% of the college women on two widely different campuses admitted to occasionally "playing dumb", to concealing academic honors, or pretending ignorance (Komarovsky, 1953). Even Vassar women who valued achievement were reluctant to develop their potential in such a way that would threaten the status or security of men by their exceptional accomplishments (Freedman, 1969).

It follows then that sex is also a strong predictor of subsequent doctoral degree aspirations among college undergraduates. Although more women than men have been found to increase their desire during their undergraduate years to do graduate work, the vast majority of women aspiring to graduate school plan to work for a master's degree only; most students with interest in and plans to obtain a doctoral degree are males (Astin, 1963; Astin and Panos, 1969; Flanagan, et al, 1964; Tillery, et al, 1972b; Trent and Medsker, 1968). Moreover, there is a greater discrepancy between the aspirations to enter and actual entry of women into graduate school than there is for men. The results of Thistlethwaite's study of academically talented students revealed that 78% of the women aspired to graduate school but only 27% actually enrolled whereas 89% of the males aspired to graduate school and 62% actually entered within one year after college graduation. Of the upperclassmen recently surveyed nationally by the Higher Education Project of the Center for the Study of Evaluation, 70% of the men indicated that they planned to enroll in graduate school compared to 57% of the women; 27% of the men planned to earn a doctoral degree compared to less than 9% of the women (Morey, Pace and Trent, 1970).

In 1966, women received only 34% of the master's degrees awarded as opposed to 19% in 1900, 40% in 1930 and 38% in 1958. Women earned only 12% of the doctorates in 1966, a decrease from the 1930 figure of 15% and the 1920 figure of 16% (Painter, 1971). Although the absolute number of women receiving Ph.D.'s increased from 93 in 1920 to 885 in 1956, their relative proportion has shown a marked decline. More specifically, according to the National Manpower Council, current female doctorate holders represented only 1/300th of the women capable of earning such a degree in 1959 (Newcomer, 1959).

The statistics on women are particularly disappointing since significant differences were found in favor of females particularly in the areas of personality and cognitive development in the studies evaluated. At college entry, for example, females compared to males were significantly less stereotypic in their attitudes and values, less dogmatic, and less authoritarian. With few exceptions, although college students of both sexes showed an increase over the four-year period in critical thinking ability and a decrease in stereotypic beliefs, dogmatism, authoritarianism and unreceptivity to new ideas, for females, the more college completed, the more they became oriented to emergent values and the less they adhered to stereotypic beliefs (Lehmann and Dressel, 1962, 1963). In fact, college women showed the greatest growth in autonomy. Females who entered homemaking immediately after high school changed the least and generally regressed both in intellectual disposition and autonomy compared to their employed peers and particularly to their college-attending peers (Trent and Medsker, 1968). Interviews with Vassar women revealed similar changes: greater independence, increased sophistication, complexity, relativism of outlook, greater expression of critical attitudes and more independence from family values (Freedman, 1969).

More females than males reported that after four years of college they had come to respect views contrary to their own, were more tolerant of non-conformist dress and behavior, were less afraid of authority figures, were more interested in politics and scientific developments and were more convinced that an individual, more than the institution, can determine the quality of his education (Lehmann and Dressel, 1963). Yet, while women reported a greater degree of tolerance of sexual intimacy and more meaningful relationships with members of the same and opposite sex than did men, the majority of women (82%) reported that they would prefer their husbands to have the decision-making priority (Katz and associates, 1968). Since at college entry, women were more oriented toward traditional values and subsequently changed in the direction of emergent values, one might draw the inference that college, indeed, had at least some impact on women's growth and development. It is particularly disturbing to find however, that again women are willing to relinquish their independence and autonomy. Apparently, college women still assume that men prefer "clinging vines", and this may be an important reason why so many able college women do not pursue careers requiring advanced degrees, particularly in traditionally male-dominated fields.

Personality factors such as those described above warrant further consideration if for no other reason than their relevance to the educational experiences and career performance of college women. Rand (1968), for example, found that career oriented women compared to non-career oriented women had higher masculine personality and ability characteristics as well as higher feminine ability characteristics. Homemakers, on the other hand, had higher feminine personality and social interest characteristics. Differences between two groups of freshmen women were also found by Hoyt and Kennedy (1958). The career-oriented women were higher on achievement, intraception, and endurance while those oriented towards homemaking were higher on heterosexuality and succorance. Hoyt and Kennedy suggest that career-oriented women are motivated by one or more of four relatively independent needs: (1) need to establish worth through competitive behavior or achievement; (2) need to know and understand intellectually (intraception); (3) need to accomplish concrete goals (endurance); and (4) need to avoid relations with the opposite sex (heterosexuality). Homemakers, on the other hand, are motivated by needs for affection and acceptance (succorance) which can be satisfied by marriage.

Other studies indicate, however, that in addition to the stigma placed on career-oriented girls as a result of their generally higher ability level in high school, they are usually alienated from their families as well. Not only do they identify less with both their parents (Heilbrun, Jr., 1969) and have less communication with them (White, 1959), but they are particularly alienated from their mothers whom they perceive as dominating and rejecting (Epstein, 1970; Klein and Gould, 1969).

Using multiple regression analysis to determine which variables were most predictive of non-stereotypic career choice among upperclass college women, Karman (1972) found that, regardless of type of college attended, women with non-stereotypic career aspirations came from higher socioeconomic levels; had mothers who attained high levels of education; held more liberal attitudes toward the role of women in society, and toward international relations among governments; expressed a stronger liking for science and mathematics; maintained higher academic records in college; saw their college experiences more in terms of vocational and liberal education benefits; participated in college to a greater degree in social service and academically oriented activities; were less involved in artistically creative activities such as creative writing, dance, art, theater, and music; were more likely to come from Jewish homes; and particularly, were more theoretically oriented. In fact, the most differentiating variable was theoretical orientation, the propensity for logical, analytical and critical thinking.

The fact that the number,characteristics and outcomes of these women did not differ among the types of colleges they attended suggests that the higher educational experiences commonly offered women are not designed for their fullest development as defined in this context. The evidence is that this is as true for the select liberal arts college or university as it is for the non-selective, general colleges and universities. An illustration of this point appears in a study of 129 undergraduate women attending nine different colleges and universities where they were majoring in physical science (Dement, 1962). The findings revealed that those women who could meet the scholastic competition and were able to withstand the social pressures and cope with their special problems had certain common characteristics: strong scholastic ability and emotional security, very high motivation and strong ambitions. More significant, however, were the findings that in addition to all of the threats encountered by men in highly competitive courses with difficult subject-matter, these women had to cope with the negative attitudes of peers, personal prejudices of many professors, an increased sense of loneliness and isolation from other members of their sex, and the objections of their parents. Dement suggests that more encouragement be given to women by the institution and that special living arrangements be available to women so that those with special interests such as studies in the sciences can live together and share their work, interests, and problems. But Dement's suggestion about living arrangements, however well meaning, may be self-defeating. The suggestion's implementation might only serve to further isolate women, making it all the more difficult for them to interact with and contribute to the social, educational and professional world around them which is currently dominated by men.

Certainly more effort must be made to develop programs in higher education to counteract the myth of the "feminine mystique", the glorification of the homemaker and the denigration of the career women that has psychologically strait-jacketed so many women.

Federal legislation has begun tearing down the discriminatory job barriers for women and affirmative action programs encouraging women to seek higher education have been implemented in many colleges. In addition to removing all discrimination, however, the stigma of the "masculine" versus "feminine" career must be eliminated. Of course, the place to begin is in the elementary schools, where young children should be reading books which depict women in all kinds of role-models, not just that of wife, mother, nurse or teacher. But it is equally important that teachers and counselors, indeed the entire educational system systematically help redefine the role of women and encourage their development so that women are completely free to pursue, or not to pursue, any career or life style of their choosing.

Race

The findings from the studies pertaining to the effect of race on individual growth and development are in many ways similar in their implications to the findings on women. That is, it has not yet been determined if there really are genetic differences between the races; if the apparent differences are the result of cultural discrimination, or a combination of both heredity and environment. Renewed interest in this debate was aroused by the work of Jensen (1969) who contends that abilities are genetically determined and that Negroes are genetically inferior. His findings and his interpretations have been the subject of much controversy and before any conclusions can be drawn, more research in this area is clearly needed.

Tests of aptitude and records of achievement have historically been barriers to Negroes' higher education and thus their social mobility (Tillery, et al, 1972a). And consistently, minorities, particularly Negroes, tend to have the lowest scores on both verbal and nonverbal intelligence tests (Bachman, 1970; Coleman, 1966). Moreover, the discrepancy between Caucasian and minority students' (excluding Orientals) test scores is cumulative. That is, the average minority student scores distinctly lower on standardized achievement tests at every grade level than the average Caucasian student. In the 5th grade, for example, Negro students were about one year behind Caucasians on mathematics and verbal aptitude tests. But the deficiency in achievement was progressively greater for minority students at progressively higher levels. By the 11th grade, the Negro students were from 2 to 4 years behind Caucasian students and at the 12th grade, minority students' scores were further below the Caucasian students than they were at the first grade (Coleman, 1966; Hilton, 1971).

These results, however, are based on the scores of standardized achievement tests, and an important issue that must be considered is the "cultural bias" of these tests. Standardized tests of achievement with national norms are supposed to be based on a sample representative of the national population. To be precise, then, the sample population must be stratified in the same proportions as the national population in terms of Negroes, Orientals, Caucasians, rich, poor, etc. As a result, any nationally normed test reflects primarily the characteristics and values of the white middle-class, simply because they represent the largest proportion of the national population.

Using tests normed on a white middle-class population for another quite different ethnic population results in cultural bias which can in turn lead to gross misinterpretations of data. For example, if nationally normed achievement tests use written instructions and test items, children's scores are affected by their ability to read and to understand the language. If they have language problems or even dialect differences their ability scores will more than likely be lower than the scores of students without the problems. Their true ability, however, has not necessarily been tested. Attempts to develop non-verbal tests of ability to compensate for this problem, however, have as yet been unsuccessful (Averch, et al, 1972).

In addition, standardized tests of ability and achievement reflect the values and goals of the normative population, i.e.,the white middle class. Thus, these tests easily lend themselves to gross misinterpretations of the abilities of the culturally different minorities. The problem of cultural bias in testing is described by Holtzman (1971):

> The emergence of the black culture, the Chicano movement, and the stirring of the American Indian as well as other forgotton groups...have forced white America to re-examine its soul. The result in the field of mental measurement has been a recognition and acceptance of cultural variability, a search for new kinds of cognitive, perceptual, and affective measures by which to gauge mental development and a renewed determination to contribute significantly to the task of overcoming educational and intellectual deprivation. (p. 551)

The great majority of American children attend schools that are largely segregated. It is important to note in this respect that although

Caucasians consistently scored highest on tests of intelligence and achievement, Negroes in integrated schools scored second followed by other racial minorities, Negroes in northern segregated schools and lastly by Negroes in southern segregated schools. In particular, for grades 6, 9, and 12, the highest average test scores were obtained by Negroes whose classmates were more than 50% Caucasian. Students who entered integrated schools in the early grades attained consistently higher scores than other groups, particularly on tests of reading and mathematics achievement (Coleman, 1966). These findings have been severely questioned by several analysts however. Bowles and Levin (1968), for example, cite the fact that Coleman did not observe the behavior of poor children who attended primarily Caucasian poor schools and then transferred to Caucasian middle-class schools. Thus, Coleman compared only the outcomes of Negro students who attended majority poor schools with the outcomes of Negro students who attended majority middle-class schools.

In addition, predominantly poor schools tend to serve communities that are substantially different from communities served by primarily middle-class schools. Therefore, of course, poor students who attend predominantly middle-class schools come from different families and live in different kinds of communities than those disadvantaged students who attend predominantly poor schools. Thus, background factors may cause students to perform better, and not the fact that they are in integrated schools.

Moreover, Coleman's data were collected from academic, vocational, and comprehensive high schools but his original analyses did not distinquish among these three different types of high schools. Students were assigned to schools on the basis of their present ability. Thus, the proper interpretation of Coleman's findings according to Smith (1972) is that students assigned to schools for students of high ability outperform students not assigned to those schools. Consequently, Coleman's results were a product of the assignment process, not the student body effect. Smith concludes that there is "no evidence that the characteristics of the student body have a strong independent influence on the verbal achievement of individual students" (p.76).

Despite these arguments, however, Coleman's findings are consistent with several other relevant studies not evaluated in the present project. Veroff and Peele (1969), for example, found from pre- and post-test comparisons that Negro boys who moved from predominantly white schools gained significantly in autonomous achievement motivation within a year. Caplin (1968) found significant differences between students in integrated and de facto segregated schools in school-related self-concept and aspiration, although not in self-concept and aspirations having to do with personal and social qualities. During the course of two consecutive summer Upward Bound sessions Hunt and Hardt (1969) found significant, positive changes in attitudes and motivations such as feelings of self-esteem and internal control among both white and black students compared with control groups which did not participate in the program. Unlike the white students, however, the Negroes declined in grades over the 18 month period of the study.

Thus, several studies indicate that black students change positively both in verbal achievement as well as in attitude and aspiration when they are in classes with a majority of white students but not when they are in classes with a minority of white students even though the school is technically integrated (see Katz, 1969; McPartland, 1969). The importance of the interaction of students with their school and educational attitudes and decisions is also suggested by the fact that involvement with school activities has been found to be predictive of post-high school education for both minority students and high school graduates at large (see Selinger, 1968, Trent, 1970).

But even opportunities for academic involvement as such is limited for many minority students. It was not surprising to find that nationally, Negro students had fewer of some of the facilities commonly related to academic achievement, such as less access to physics, chemistry and language laboratories, fewer books per pupil in school libraries; insufficient supply of textbooks; fewer accredited schools and less access to academic curricula. Puerto Ricans had less access to vocational curricula as well. In addition, the average Negro student attended a school where the principal was Negro, the guidance counselors were less experienced, the teachers were less likely to rate students high on academic motivation and ability and were more likely to teach large classes (Coleman, 1966).

No significant relationships were found between curriculum and race; within each curriculum, Negroes achieved lower scores than their Caucasian counterparts (Hilton, 1971). However, more Caucasians than Negroes were enrolled in college preparatory curricula and there was a greater preference for vocational education among Negroes than among Caucasians (Coleman, 1966).

The quality of teachers showed a strong relationship to minority students' achievement (Coleman, 1966; Husen, 1969; Flanagan, et al, 1962). Moreover, this relationship was progressively greater at higher grades, indicating a cumulative impact of the qualities of teachers on student achievement. Of the teacher characteristics measured, those that bore the highest relation to student achievement were the teachers' level of education, the educational level of the teachers' parents, type of college attended, scores on tests of verbal competence, experience, and salary (Coleman, 1966; Flanagan, et al, 1962). Again, however, student achievement was measured on standardized achievement tests, and the impact of both school facilities and teacher characteristics on student outcomes was not definitively established.

The relationship found between minority students' achievement and their teachers' characteristics seems to warrant special attention since substantial intelligence and achievement test score differences were found to exist between Negro and Caucasian future teachers at both the freshman and senior years of college. Moreover, this gap widened in the South where most of the Negro teachers were being trained (Coleman, 1966). [Again, these results should be interpreted with caution, however, since clearly, there is considerable overlap between students' backgrounds and their school resources.]

Schools tend to serve relatively homogeneous populations in that the students generally live in the same neighborhood, are subject to the same community influences, and their families are generally similar in terms of their socioeconomic characteristics. Thus it is very difficult to determine what part of the variation in student outcomes is due to variation in school resources, peer group influences, or to variations in student backgrounds.

For example, older, run-down, and less well-equipped schools are usually found in the older parts of the city that often become minority poverty areas. New, well-equipped and attractive schools are more likely to be found in the middle- and upper-class suburbs. Even if research data indicated that students in the newer, better equipped schools consistently obtained higher achievement scores than students in the older schools, we would still not know if students achieved better because their schools had better facilities or because they came from more advantaged backgrounds. Of course, it would be nice if all students could attend schools with good facilities. But in view of the methodological problems mentioned above, without further research, policy-decisions, particularly concerning appropriations for school facilities, must be based on other criteria in addition to student outcomes as presently measured.

Perhaps the effect of schools on scholarly formation however is more mitigated when it pertains to "disadvantaged" students. Torrance (1966) concluded that disadvantaged students' lack of motivation toward the school results from many factors within the school. These include indications that disadvantaged students have relatively little opportunity to use or communicate what they learn; that required tasks are either too difficult or too easy for them; that they have no opportunity to learn in ways that they prefer; and that they have no outlet for their own creative abilities or rewards for certain kinds of excellence.

Factors such as these lend credence to Mathis'(1968) thesis that poverty of experience (particularly with the middle class) rather than socioeconomic status is responsible for the poorer school performance of the disadvantaged. The separation of the two seems to be an artifact, however, since the former is the result of the latter. In any event, a great part of the problem appears to be that the school is not sensitive enough to the nature, needs, and differing experiences of its students, particularly of those who are disadvantaged, but others as well. Indeed, Bowles and Slocum (1968) concluded on the basis of their survey of a random sample of juniors and seniors in one high school that school experiences tended to reinforce the handicap to educational achievement and subsequent occupational mobility among low socioeconomic status students inflicted with relatively low self-images. Relatively unsuccessful and uninteresting experiences aggravated the situation.

Rosenthal and Jacobson's (1968) pioneer study also comes immediately to mind. The subjects of the study, one-sixth of whom were Mexican-American, were enrolled in a school in a lower class community of a medium-size city. At the beginning of the school year the students were randomly assigned to 18 teachers who were told which of their students could be expected to show "dramatic intellectual growth" during the coming year on the basis of a test administered the previous year. The "special" students were chosen randomly so that their extraordinary potential existed only in the minds of the teachers. Experimentally controlled pre- and post-test comparisons revealed significantly greater intellectual growth on the several variables considered such as verbal and reasoning IQ and reading comprehension for the "special" students. Strong support was given the hypothesis that a teacher's expectation for a student's behavior "could come to serve a self-fulfilling prophecy."

The exact cause for the self-fulfilling prophecy and the duration of the increased growth remain matters of speculation and concern, especially since the younger children in the study showed some decline in their growth when they were exposed to other teachers the following year. Factors that may well account for the change in the students include the way the teachers and students interacted, the new norms and expectations for learning behavior the teachers might have presented the special students, and the consequent revision of self-image and role conception that may have taken place.

Although, according to Coleman, the average minority students' achievement was more affected by the strengths or weaknesses of their schools' facilities than were Caucasian students, the point has already been raised that differences in the mean growth of Negroes and Caucasians may be a function of family background. Parents of Caucasian children had more education and were working in higher status occupations than were parents of Negro children (Hilton, 1971). Moreover, minority high school students, again with the exception of Orientals, had far less conviction than did Caucasians that they could control or affect their own environment or destiny. When they did, however, their achievement was higher than that of Caucasians who lacked that conviction (Coleman, 1966; Cf., Gurin and associates, 1969). Self-concept and self-confidence have consistently been correlated with academic achievement and educational aspirations (Bachman, 1970; Coleman, 1966; Tillery, et al, 1972). Thus, self-concept may be the critical antecedent variable causing minority students' lower achievement and aptitude, and contributing to their high rate of dropout from high school.(According to Coleman, 17% of Negro adolescents age 16 and 17 dropped out of high school compared to only 9% of Caucasian adolescents.)

Katz's (1969) review of research led him to conclude that Negro and Caucasian students do not differ in derived educational goals but rather in their expectation of attaining these goals. Positive influence on decision and achievement comes from "internality" or the students' control over his own rewards. Anxiety over school constitutes a strong negative influence that presumably leads to relinquishing of control and thus lower expectations of achieving goals.

Considerable evidence suggests that, at the least, the close experience with new norms, values, and expectations influence educational decisions and performance. Sarri and Vinter (1967) for example, concluded on the basis of their study of several Michigan elementary and high schools that student "malperformance" was the result of the interaction of both student and school characteristics; that middle class students are substantially more likely to be placed in a college preparatory program which, in turn, positively affects performance; that pupil careers are influenced by social class linked motivations, capabilities and skills; and that when the school prejudges the student, it may generate the very malperformance it seeks to eliminate.

Presenting the student with new norms, and, by implication, new roles and expectations, may have the opposite effect. This would seem likely, anyway, if moving from lower socioeconomic to middle class school settings results in the encounter with and subsequent assimilation or internalization of new norms. Indications are that this is the case.

High school Negroes reported very high levels of motivation and interest in academic work and aspirations for college compared to whites of comparable economic levels. Oriental Americans had the highest motivations and aspirations to college; Mexican-Americans, the lowest. At the same time, however, the educational aspirations of these high school minority students exceeded their actual enrollments in college (Coleman, 1966; Tillery, et al, 1972).

Epps (1969) found that among northern and southern Negro students, socioeconomic status was strongly related to educational expectations and that self-concept of ability was strongly related both to grades and to amount of expected education.

Thus, not surprisingly, most students from minority racial backgrounds, except for Orientals, were more likely not to enter college; if they did, they were more likely to attend junior colleges, particularly in California, and were more likely to withdraw from college than Caucasians (Astin and Panos, 1969; Tillery, et al, 1972). Here again, there are differences in the schools' facilities and resources attended by Negroes. In general, Negroes attended colleges where there was a less favorable academic environment measured in terms of the overall grade point average of the school, where fewer faculty had Ph.D.'s and where the institution had higher dropout rates (Coleman, 1966).

Negro college students were more likely than other college students to choose "social science majors" and "practical" careers in the health professions (Astin, 1963; Astin and Panos, 1969). In fact, non-Causaians even those with college aspirations were much more concerned about work versus college than their Caucasian peers (Tillery, et al, 1972b). These findings raise several difficult questions: Was this concern generated by their parents? Was their concern for work and vocational preparation a reflection of their desire for social mobility or a realistic need for financial resources? Such questions cannot be answered on the basis of the data under review but deserve attention in the future.

The repeated evidence, therefore, is that the relationships between the educational process, resources, and minority students' self-concept must be more intensively investigated. If positive self-concept is not established in the early years of a child's life, the schools must make a concerted effort to help these children overcome their feelings of inadequacy and fulfill their potentials. Moreover, serious questions must be raised about the application of traditional admissions criteria to minority youth. Motivational and attitudinal characteristics which have been ignored in the past must now be considered, particularly since colleges have found that "high risk" minority students can succeed with proper tutoring and counseling. The critical word, of course, is proper!

Socioeconomic Status

The class of variables pertaining to socioeconomic level was investigated in almost all of the studies under review and the consensus of findings relating socioeconomic status to aptitude, interests, personality factors and achievement is impressive.

Socioeconomic status may be measured along a continuum from high to low, and associated with differences in socioeconomic status are differences in financial status and values among families and individuals that have great bearings on educational aspirations. High socioeconomic status implies college education and a professional occupation; a low level status generally indicates failure to complete elementary or high school and a semi- or unskilled occupation.

Socioeconomic status, however, is more than a matter of educational or financial status; it is also a matter of differential values and behavior (Trent, 1970). Perhaps it is better conceived as a complex environmental process acting on the decision-making and other important aspects of a young person's life. It is centered in the family where its dynamics have the most critical effect; and that effect bears on the individual's entire life wherever he goes, and in whatever environment he enters beyond that of his family. A number of studies indicate attributes related to the socioeconomic environment that contribute to an understanding of its dynamics and suggest the manner in which it effects the decision to enter college (e.g. Bailey, 1966; Berdie and Hood, 1965; Berelson and Steiner, 1964; Colorado State University, 1966; Grinder, 1967; Jennings and Niemi, 1968; Strodtbeck, et al, 1957). The conclusions of these studies corroborate those of the studies evaluated in the present project. Based on such research a number of generalizations may be made:

1. There is a high positive correlation between the educational attainment and occupational achievement of the father, determined by the status of the job and the income it produces. Similarly, there is a high positive correlation between the father's occupational achievement and the educational achievements and aspirations of his children. Thus, scholastic aptitude or what is commonly called "academic aptitude" was found to be positively related to an individual's socioeconomic background (Bachman, 1970; Coleman, 1966; Flanagan, et al, 1964; Husen, 1969; Jones, et al, 1972; Super, 1967; Trent and Medsker, 1968). Students with higher socioeconomic status backgrounds have considerably higher vocational and educational aspirations compared to students with low socioeconomic status backgrounds (Bachman, 1970; Flanagan, et al, 1964; Tillery, et al, 1972b; Trent and Medsker, 1968).
2. The higher one's socioeconomic status, the greater are his contacts with all socioeconomic levels, and the greater are his range of experiences and opportunities for choice generally. This may help account for the fact that the higher one's socioeconomic status, the greater the value he places on higher education for means and ends, including information and knowledge. The interpretation here is that broadened experiences create new interests and the need for knowledge to satisfy these interests (Trent, 1970). At the same time, higher socioeconomic status students have available to them more informal educational opportunities and experiences such as discussing homework with parents, dining-room table "politics", and a general cultural milieu of the home (Tillery, et al 1972b; Trent and Medsker, 1968).

Although more will be said in the next section about the influence of the school environment on the decision to attend college, it is important to note here that socioeconomic status indirectly influences the quality of both the formal and informal educational opportunities and experiences available to the student. In fact, the primary way in which socioeconomic factors operated in affecting achievement scores during high school was by affecting certain behaviors, such as choice of an academic or non-academic program, choice of courses, and planning for college which, in turn, had a more direct effect on test scores (Flanagan, et al, 1967). Not only are proportionately more students of higher socioeconomic status backgrounds enrolled in academic or college-preparatory curricula with more diversified choices of classes and enrichment programs (Bachman, 1970; Coleman, 1966; Flanagan, et al, 1964; Hilton, 1971; Husen, 1969; Lehmann and Dressel, 1962, 1963; Tillery, et al, 1972; Trent and Medsker, 1968) but school facilities and resources, such as the availability of guidance programs and types of tests used to aid in placing students in the various curricula and to help the student gain a better understanding of himself vary according to the socioeconomic status of the community and region of the country (Coleman, 1966; Flanagan, et al, 1962; Trent and Medsker, 1968). Moreover, as students progressed, socioeconomic status increasingly discriminated among curricular groups with higher socioeconomic status students over-represented in college preparatory programs. This factor probably accounts for differences in the curricular choices of Negroes and Caucasians. More Caucasians than Negroes are enrolled in academic programs and as mentioned previously, parents of Caucasians had more schooling and were working in higher status occupations than parents of Negro students (Hilton, 1971). Even when school program was held constant, however, high socioeconomic status students had higher mathematics scores and higher mathematics interest scores than low socioeconomic status students (Husen, 1969).

3. Parents at all socioeconomic levels are a potential influence on the values and behavior of their children. This adds to the significance of the middle class parents, who much more than those of lower socioeconomic status stimulate a need for achievement and encourage their children to achieve more, both in academic and in non-academic areas. Recent research indicates that a majority of parents at all socioeconomic levels would like their children to have a higher education but, as noted, upper socioeconomic level parents place much more stress on higher education, take a greater interest in it for more reasons, and do much more to encourage their children to attain a higher education.

For example, the evidence indicates that not only are changes in mental test scores as a child develops related to parents socioeconomic status and to their level of education, but intellectual competence and achievement, dependency, critical thinking ability, attitudes and values as adults are also highly related to socioeconomic status and educational level of the parents (Kagan and Moss, 1962; Jones, et al; 1972; Lehmann and Dressel, 1963; Trent and Medsker, 1968).

Educational level of parents was also related to students' choice of high school curriculum. Proportionately more students enrolled in academic curricula had fathers who were college graduates compared to students in non-academic curricula (Hilton, 1971), and for females, college attendance was also related to parents' level of education (Tillery, et al, 1972a). In addition, the highest rate of interest in the Ph.D. and actual entrance into graduate school was found among males whose fathers were college graduates (Astin, 1963; Thistlethwaite, 1965).

The entire family structure, therefore, and particularly the psychological and cultural climate of the home, is a pervasive factor contributing not only to an individual's emotional growth but to his intellectual, educational, and vocational growth and development. The differences in the range of experiences, interests, and values that distinquish among levels of socioeconomic status no doubt contribute to the differences in attitudes and behavior found among students of different socioeconomic levels. Grinder's (1967) research might be interpreted to this effect. He hypothesized that among adolescent boys a strong orientation towards the father rather than peers (that is, disinterest in the "youth culture") is predictive of involvement in college-bound high school programs and that, conversely, peer orientation rather than identification with the father is predictive of dropout status. The conclusion was that in as much as his subjects could be classified as belonging to college-bound programs, general programs, or as potential withdrawals, the hypothesis was confirmed with statistically significant accuracy according to his schema. More specifically, lack of involvement in school activities was associated with low academic standing, low academic aspirations, low father-son agreements, and low socioeconomic status. Indications were that peer orientation was given impetus by low regard for father's occupation, and the two factors combined to reduce commitment to school.

Obviously, therefore, parental influence is a dominant if not paramount factor in the individual's perception of education and the resultant decisions he makes about it. The attitudes he has about education, and the role he sees for himself as an adult in relation to his education, generally originate with his parents and bear directly on the approach he takes toward education.

Questions arise, therefore, concerning the relationship between socioeconomic status and maternal practices and behavior toward their children. Since both socioeconomic status and mother's behavior toward the child contribute to a child's cognitive development, and since students of higher socioeconomic background show more cognitive ability and growth, perhaps mothers of higher socioeconomic backgrounds are more knowledgable regarding child-rearing because of their higher educational level or can more readily afford and seek counseling and advice regarding the raising of their children. Or, perhaps the fact that a higher socioeconomic status provides financial security and comfort frees mothers of higher socioeconomic status from worry about financial problems enabling them to be more responsive to their children's emotional needs. These questions represent just a few of the crucial issues that must be dealt with to best ascertain, understand, and thereby promote student development.

These issues are further highlighted in reference to additional findings regarding the family environment. Positive family relationships are negatively correlated with young people's aggressive behaviors, somatic symptoms, and delinquent and rebellious behaviors, and a positive relationship exists between positive family relations and positive attitude toward school, a higher degree of reported happiness, a higher level of self-esteem and what may be defined as good social values--kindness, generosity, self-control, and responsibility (Bachman, 1970; Jones, et al, 1972; Kagan and Moss, 1965). In addition, males having positive family relations compared to those with low or negative family relations, tend to have a higher need for social approval, higher vocational aspirations, and a lower impulse to aggression (Bachman, 1970). The significance of the relationship between the family environment, including parents' attitudes and values, and students' growth and development can be seen quite impressively with respect to the educational development of young people. Parental encouragement to continue education was a critical factor in students enrollment in academic or college-preparatory programs (Hilton, 1971; Tillery, et al, 1972a; Trent and Medsker, 1968). Moreover, there is a relationship between parental encouragement to go to college and socioeconomic status, but the strong relationship between parental encouragement and college attendance persists even when controlling for both academic aptitude and socioeconomic status simultaneously (Trent and Medsker, 1968).

One of the most broadly based samples to provide information about this relationship was the approximately 10,000 students in 37 high schools across the country whom Trent and Medsker first surveyed as high school seniors and then followed up for another five years. Twice as many eventual college attenders as nonattenders reported in the original survey that they had been encouraged by their parents to enroll in college. Nearly 70% of the students who later entered and persisted in college reported while they were still in high school that their parents definitely wanted them to attend college, compared to less than 50% of the withdrawals and less than 10% of the non-attenders. They also reported having discussed college plans more with their parents, having sought advice from their parents more, and more interaction and rapport generally with their parents. More non-attending students with college aptitude compared to their college attending peers reported less parental involvement in their educational decision, feeling less close to their fathers and receiving less help and encouragement from their parents. Many of these conditions were found in the studies of Astin, 1963; Astin and Panos, 1969; Bachman, 1970; Hilton, 1971; Katz, et al, 1968; and Tillery, et al, 1972b. In fact, the relationship between school characteristics and student achievement was reduced for students whose families encouraged achievement (Coleman, 1966). It is also significant that lack of parental encouragement in the pursuit of educational goals was accompanied by a deep sense of alienation between a student and his parents, particularly the father (Tillery, et al, 1972b).

In addition to parental expectations and encouragement, other characteristics of parents are associated with college attendance among their children. The greater interaction between college-bound children and their parents has already been noted. The college bound, compared with the non-attenders in the Trent and Medsker (1968) sample also reported their parents to be more ambitious, energetic, intellectual, loving, and orderly--traits presumably conducive to an achievement-oriented, supportive family climate. In contrast, the students who decided against college were more likely to report their parents to be easygoing and quick tempered.

Rehberg (1966) offers a provisional model that posits elements that could be anticipated from the above review. These include the conditions that parents' education is a partial determinant of the family's socioeconomic status, that the parents' education and social status influence adolescent educational expectations through the intervening variable of parental pressure and independent of it, and that there is a negative relationship between family size and parental encouragement for children to continue their education. (This latter instance may result from the inability of parents of large families to give adequate individual attention to their children, apart from socioeconomic status and values associated with large families.)
The implication of these last findings is that parents of noncollege youths show some greater tendency toward negative traits, at least in terms of indifference and display of temper. This negativism may have bearing on the findings from several independent studies of students who not only failed to enter college but also failed to complete high school (Maryland State Department of Education, 1963;

Pearl, 1962). Forty-three percent of the parents of the dropouts had been involved with crime or delinquency. One half of them encouraged their children to leave school or were indifferent to the decision, even though 52% of the parents were unskilled or unemployed and one third of them were on welfare. Perhaps most significant in terms of the influence of parents as models is the fact that approximately 80% of the parents of the dropouts had themselves dropped out of school.

4. The result is that students whose fathers' occupations are classified at the high socioeconomic level (professional and managerial) increase in the proportion of their representation from grammar school to college so that there is an over-representation of college students of high socioeconomic status. In fact, proportionately more students of high socioeconomic status background go to college even when intelligence and academic aptitude are held constant (Bachman, 1970; Flanagan, et al, 1971; Tillery, et al, 1972a; Trent and Medsker, 1968). Students of low socioeconomic status are for the most part precluded from higher education. The only exception is in the junior colleges where there generally is a larger representation of lower socioeconomic status than in four-year colleges and universities. But even in areas where there are a large number of conveniently located junior colleges, students from average or below average family income levels are more likely to have no plans to go to college and actually attend college than to have plans to go to college but then not go (Tillery, et al, 1972a). Moreover, even when they do go, lower socioeconomic status students usually withdraw without completing either a vocational or a transfer program (Trent, 1970).

The relationship between socioeconomic status and type of college entered extends beyond the junior college and exists for students at all levels of aptitude. For example, students in liberal arts colleges, universities and private institutions are over-represented at the high level of socioeconomic status and students attending teachers colleges and many state colleges are under-represented (Flanagan, et al, 1967; Tillery, et al, 1972a; Trent and Medsker, 1968; Trent, 1970). The widest range of socioeconomic status is found in the junior college, but in this case, junior college students are over-represented at the low level of socioeconomic status.

5. As discussed previously, the relationship between socioeconomic status and college entrance varies by sex and race. Caucasian men of high socioeconomic status are the most likely to enter college, particularly if they received high grades in high school. High ability and high socioeconomic status women differ only negligibly from the men in this respect, but particularly when achievement is not outstanding, proportionately fewer women than men enter college, particularly at the lower levels of socioeconomic status (Astin and Panos, 1969; Trent and Medsker, 1968).
6. There is some evidence that financial assistance is an important factor in the decision to enter college, especially for high ability, low socioeconomic status students. There is ample evidence, however, that the socioeconomic environment of the family, independent of both ability and finances is a significant factor in a student's determination

of the level of education he undertakes after high school. The fact is that the economic factor is not the key variable in the decision to enter college, regardless of socioeconomic status. In fact, where parents are not concerned with a school's program, regardless of the money they are willing to spend on education, the school is less effective in terms of post-secondary educational attainment (Hilton, 1971). In addition, high school seniors with the aptitude for college who do not attend report financial reasons to be a barrier to their attending college more than their college-going peers, but only a small minority of withdrawals report leaving college for financial reasons (Astin and Panos, 1969; Tillery, et al, 1972a; Trent and Medsker, 1968). Parental financial support is however, associated to some degree with completing four years of college and obtaining a degree (Astin and Panos, 1969).

7. Socioeconomic status also exerts a profound, direct effect on an individual's intellectual and social capabilities. Corollary findings are manifest in most of the other research previously cited dealing with the socioeconomic environment. Indications are that socioeconomic status determines environmental conditions which, in turn, condition such personality variables as academic self-concept and need for achievement, and these variables differentiate college-bound and non-college subjects. The higher socioeconomic status students have been shown to have more positive self-concept about their school ability

(Bachman, 1970; Flanagan, et al, 1964; Trent and Medsker, 1968); more positive family relations; and more positive relations with teachers and school personnel (Tillery, et al, 1972b; Trent and Medsker, 1968).

The results appear not only in the greater motivation, persistence, and achievement of higher socioeconomic status students compared with those of lower status; the higher status students also are more frequently social leaders, are perceived by others as more competent, have more influence on others, participate more in extra-curricular and other activities and, as college-bound students, tend to be more sociable, less shy, and to have fewer conflicts with their families and authority. Lower status students, instead, show dependence on but also distrust for authority, are more resigned to physical and psychological suffering (at least in the past), have an inferior self-concept and a personality more characterized as limited, restricted, and authoritarian. Knupfer's (1947, p. 114) conclusion of some years ago is pertinent if not largely explanatory in this context:

> Closely linked with economic underprivilege is psychological underprivilege: habits of submission, little access to sources of information, lack of verbal facility. These things appear to produce a lack of self-confidence which increases the unwillingness of the low-status person to participate in many phases of our predominantly middle-class culture.

The earlier statement that socioeconomic status is more than a matter of educational or financial status but also one involving values and behavior should now be clear. Moreover, the fact that so many of the variables related to socioeconomic status (e.g. curricula, achievement, self-concept, aspirations) are also associated with academic aptitude illustrates the interaction of the variables. Therefore, understanding the relationship between two sets of variables, or main effects, is not enough. The interactions of the variables and the relative contributions of mediating variables, which, in many cases may be more important than the main effect relationships, must also be determined. In the majority of cases, however, these interacting relationships have not been specified or interpreted.

8. As indicated above, the chances that children with superior intelligence will attend college increase with their socioeconomic status. In recent years, there has been an increase in proportions of students who attend college, and in some regions a majority of high ability students of low socioeconomic status enter college. Yet, the distribution of socioeconomic status has not changed substantively among college students in spite of increased numbers of colleges since 1945, an increased proportion of high school graduating classes who enter college generally, and an increase in college attendance among the brightest of low socioeconomic status students (Trent, 1970).

Although four-year college and university students certainly come from all levels of socioeconomic status, the proportion of students from the lower socioeconomic status levels in the colleges is still relatively small. One would expect to find, and in fact, does find, that socioeconomic status factors are less related to persistence in college than to initial entry. Although there is some relationship between socioeconomic status and college persistence, the socioeconomic level of the vast majority of persisters and withdrawals overlap (Trent and Medsker, 1968). Thus, the phenomenon of withdrawal occurs over the entire range of socioeconomic status, even though a disproportionate number of withdrawals are of low socioeconomic status even when ability is held constant.

9. The influence of parents and socioeconomic status on students' vocational development is also apparent. A study by Baird (1967b) indicated that parents' socioeconomic status was a primary determinant of both college choice and vocational orientation. The evidence from the studies reviewed herein supports this contention. For example, parental occupational level of students in junior or senior high school was related to several vocational development criteria: realistic reasons for changing jobs, stabilizing vs. floundering vocational behavior at age 25, occupational attainment and occupational satisfaction at age 25. However, self-estimated career success was related to the subject's own attained educational levels, not to comparisons between their levels and those of their fathers (Super, 1957). In addition, socioeconomic status was related to students later employment status. Regardless of any college experience, but paramount among non-college males, the smallest proportion of unemployed youths was at the low socioeconomic level (Trent and Medsker, 1968).

College students are strongly influenced in their aspirations, and thus their choices of occupations, by their family relations, particularly parental aspirations, as well as by available opportunities (Bachman, 1970; Katz and associates, 1968; Tillery, et al, 1972b; Trent and Medsker, 1968). Students from less affluent families compared to those from more affluent families planned disproportionately to obtain the master's degree and tended towards engineering and teaching. College students from higher socioeconomic status, particularly those whose fathers were clergymen, lawyers, physicians, or teachers tended disproportionately to choose the same occupations as their fathers, and in general, educational aspirations at college entry predicted subsequent Ph.D. aspiration and also entry into graduate school (Astin, 1963; Astin and Panos, 1969; Thistlethwaite, 1965).

Closeness of family relationships, however, was not necessarily a determinant of shared values and attitudes between students and their parents. In fact the group of college students reporting the greatest pleasure and satisfaction in their use of intellect also appeared free or even alienated from their parents. Nevertheless, despite the rebelliousness associated with the increasing autonomy related to college-attendance, few college students proposed a life-style different from their parents (Katz and associates, 1968).

Regardless of the wealth of evidence concerning socioeconomic factors, and the several hypotheses raised pertaining to the way in which socioeconomic status operates to influence the decision to enter college, several critical questions remain unanswered. For example, what is the precise relationship of socioeconomic status and the family environment: How much does each of these factors contribute to the other? To what extent can the experiences outside of the home to which the student is exposed modify or be modified by students socioeconomic status and family background?

More research is clearly needed in these areas. In addition, the constituent elements of socioeconomic status must be explored, particularly since the evidence is that these elements form an important part of the general family background and environment. Most indices of socioeconomic status included the educational level of the parents as well as the occupational level of the father (Astin and Panos, 1969; Flanagan, et al, 1964; Hilton, 1971; Husen, 1969; Kagan and Moss, 1962); some were based on a composite which included the number of books in the home, the number of televisions, radios and stereo sets, or the size of the students' homes and number of occupants in them (Astin, 1963; Bachman, 1970; Jones, et al, 1972; Lehmann and Dressel, 1962, 1963). Under the circumstances, the influence of socioeconomic status on students' development might be more directly examined in terms of its operational definitions, with indications of the comparative advantages and disadvantages of using one definition over another. Perhaps then it will be possible to answer some of the questions raised above.

Religion

An important correlate of family status and family environment is religious background. It is important in this context particularly since religious background has a demonstrated effect on educational attitudes, values, and activities which is intermixed with and also independent of socioeconomic status and academic aptitude.

For the last several decades Jews have been over-represented in college and fundamentalist Protestants and--prior to the last few years--Catholics have been under-represented. The representation of white, "middle" Protestants has consistently fallen between these two extremes. These differences may in part be accounted for by values espoused by the different ethnic groups comprising these religious "sub-cultures" but there is no doubt that socioeconomic status has also been related to these differences. Catholics for example, largely of immigrant background, have been heavily over-represented at the lower levels of socioeconomic status (Trent, 1967). Yet, the Jewish people too, also from immigrant backgrounds are over-represented at the higher levels of socioeconomic status.

More has been involved, however, than ethnic background or socioeconomic status in the over-representation of Jews and the relative lack of college attendance and subsequent scholarly productivity among Catholics and Protestant fundamentalists. Until very recently Catholics were under-represented among youths who were planning to attend college and who actually did attend. This finding appeared even when controlling for socioeconomic status (Trent, 1967).

Much of this phenomenon can be attributed to a close church-family-self system where religious values perpetrated by the church prevailed over those of the family and the individual (self) subject to both family and church, and where the values of the church and thereby the family, had in effect tended towards anti-intellectualism and the discouragement of higher education. Thus, as has been mentioned previously, the values of parents are a pervasive factor and the values of some minority parents may inhibit the development of positive self-image and sense of control which can be reinforced by religious affiliation. And, of course, parental values toward education will thus influence students' educational behaviors and attitudes.

From early stages of history Catholics were very dependent upon their church which was a highly structured, dogmatic, and protective institution. Catholic bishops had originally intended that all Catholics receive their entire education in church schools, and until the last several years almost all Catholics did attend parochial elementary schools and the great majority of them attended Catholic high schools as well. Particularly in the parochial schools the majority of teachers did not have a baccalaureate degree or teaching credential. Although this may have been enough to contribute to inferior educational output, Catholic education in addition, in the past, consistently held up for ridicule or suspicion non-Catholic, "secular" thinkers and educational systems in the interest of "protecting the faith." For their further protection Catholics were also strongly encouraged to confine marriage and close friendships to their co-religionists. This situation provided substantial reason for findings of an extensive body of research that has shown Catholics not only to be under-educated but also to be unduly authoritarian, close-minded, clannish, and unconcerned about intellectual, scholarly attainment.

There is now evidence that in the last few years Catholics are as likely as Caucasian Protestants to attend college and aspire to post graduate education (Creager, et al, 1969; Tillery, 1969; Greeley, 1968 and 1969). Greeley also concluded that Catholics show the same intellectual interests and attainments as non-Catholics on the basis of survey and post graduate followups of a sample of graduates originally studied as seniors in selected colleges. An abundance of evidence based on validated instruments matched against observed behavior refuted this position, however (Tillery, 1969b; Trent, 1967). According to Lehmann and Dressel (1962) and Trent and Medsker (1968), critical thinking ability, values and attitudes, in addition to autonomy, differed according to students' religious backgrounds both at college entry and subsequently. Catholics and Protestant fundamentalists were more stereotypic than other Protestants or Jews and were also more traditional value-oriented; Jewish students were more emergent in their values. In fact, the greatest negative change in intellectual disposition and autonomy during the first four years after high school occurred among Protestant fundamentalists and Catholics compared to other groups.

However, in a more current cross-sectional survey of freshman and upperclassmen students in a variety of colleges across the country, Schleyer (1972) found that Catholics were not only represented in college according to their proportion of the national population, but that their level of measured intellectual disposition approximated that of the liberal and moderate Protestants surveyed. The Jewish students, however, remained far superior in intellectual disposition than any of the other students surveyed, and the Protestant fundamentalists far inferior. These data were collected some time after the Vatican councils intiated by Pope John XXIII which led to immense self-criticism, awakening, openness and change in the Catholic church and its whole church-family-self system. This change is likely reflected by current Catholic college students, but apparently such a "renaissance" has yet to develop among the fundamentalists.

On another dimension, although less than one third of the male and one half of the female college students reported much change in their moral or religious views after entering college, (Katz, et al, 1968; Lehmann and Dressel, 1962, 1963) religion had a few scattered relationships to educational aspirations and plans. For example, there was an inverse relationship between concern about one's stand on religion and educational aspirations. Those with less extensive aspirations were more concerned about their stand on religion (Tillery, et al, 1972). Religion also had a few scattered relationships to final major field choice in college. Jewish students tended to be interested in law or medicine; Catholic students tended to avoid education (Astin and Panos, 1969).

In sum, great structural and attitudinal changes, encouraged by an immense wave of self-criticism, much of which culminated in the Second Vatican Council, have been taking place in the Catholic church and its educational system. No doubt these changes have affected the goals and attitudes of many Catholics so that they are now seeking education to the extent of at least their moderate Protestant peers, and are well on their way to assimilating their peers' attitudes and values as well. Still, the fact is that this is a very recent phenomenon, likely retarded because of the influence of religious press. The point is that the belief system that is imposed on the individual, whether religious or otherwise, can have definite bearing on the decision he makes about his education, and therefore warrants consideration.

Chapter 4.

SCHOOL AND COMMUNITY ENVIRONMENTS

There are, of course, environmental factors other than family which influence or condition the ways in which an individual views his life and the decisions he makes about his life. He is influenced by the experiences, opportunities, and constraints that are provided by the community in which he lives and the schools he attends. Thus, a full understanding of the process of school impacts and college-going must include the environmental factors of school and community.

The press of school:

An important part of the individual's environment is the school he attends for so many hours, at least during childhood and adolescence. Just as it is known that college environments vary considerably (Astin, 1968; Pace, 1968) no doubt elementary and secondary school environments vary depending upon the characteristics of the student body, faculty, and the community and region in which they are located. Indications from the studies reviewed are that differences in school environments can affect students' educational decisions, and often negatively.

Some of the previous discussion cited evidence that teachers and counselors were not perceived by students as helpful or influential regarding their educational and vocational decisions and activities. At least a minority of students, however, approximately 18% across the country, have reported that high school teachers represented their greatest source of help (Trent and Medsker, 1968). A smaller proportion considered their teachers as the greatest source of influence in their lives (Trent, 1970).

Students who decided against college in the least proportion considered teachers to be helpful or influential. In fact, more students with high academic aspirations compared to low aspirants discussed school with school personnel and saw the school personnel as helpful (Tillery, et al., 1972). Moreover, although this was not consistent for all student samples, there was a positive relationship between frequency of counselor visitations and "fit" between college aspirations and student ability (Coleman, 1966).

No doubt many students would receive more counseling help if they did more to seek it, and many students are probably helped and influenced by teachers and counselors much more than they realize. However, apparently the great bulk of counseling does little to influence young people's decisions regarding their education and future employment. Many counselors lack the training and/or talent for effective counseling, and most of them, regardless of background or talent still do not have sufficient time to provide adequate counseling for individual students. Unfortunately, however, the students who receive the least help and encouragement from their parents are those most in need of parent surrogates at school (Trent, 1970).

In addition, discussing jobs with a guidance counselor was not related to future educational or vocational decisions and was not related to students' satisfaction with job-related decisions (Tillery, et al., 1972b). This is particularly disturbing in light of Super's finding that the information obtained in high school concerning the educational and training requirements for jobs was a good predictor of an individual's realistic reasons for changing jobs, improvement in occupation level attained, and career satisfaction of his subjects at the age of 25. Apparently counselors are not providing students with information concerning the educational training various jobs require (Flanagan, et al., 1962; Tillery, et al., 1972b).

Although it is questionable whether high schools have an impact on students, it is clear that students attending different types of high schools do differ in personality, aptitudes and achievement. For example, vocational high school students had high scores on Mechanical Information tests but scored lowest on English and low on Reading Comprehension; their abstract reasoning scores were near the average. Urban middle-class students scored significantly lower in Mechanical Information than they did in English. At grade 9, vocational students achieved higher scores on Listening Tests when compared to other non-academic students, but fell behind all other groups on the Reading and Social Studies tests. In general, however, the test score patterns of the vocational high school males indicated that although less than 10% of these students went to college, as many as 25% of them had the academic ability to enter and graduate from college (Flanagan, et al., 1964; Hilton, 1971).

The questions concerning the impact of schools raised in the section on race remain. Students' outcomes systematically vary with simultaneous variations in school resources, peer-group influences, and students' backgrounds. Thus, it is virtually impossible to separate the part of the variation in outcomes due to variation in school resources from the parts due to variations in either of the other two factors. In addition, almost every study examining school resources has found one or two school facilities significantly related to student outcomes. At the same time, many other facilities are found to be insignificant. When student samples have been stratified into various sub-groups, often separate analyses yield distinctly different results with respect to the significance of school resources for each group. Moreover, when the results of various different studies are compared, the same resources found significant in one study are often insignificant in another. Thus Coleman suggests that because Negro children attend elementary schools with more pupils per room than Caucasians, class size might be a significant factor in Negroes' achievement. However, size of class was not significantly related to achievement according to Project TALENT and Husen's data.

Another example of the conflict in findings concerning schools' impact is that of curriculum. Coleman found that curriculum was related to achievement, particularly for minority students. Hilton, on the other hand, found no significant relationship between curriculum and race; within each curriculum, Negroes achieved lower scores than their Caucasian peers. The relationship between high school curricula and college entry is also not clear. According to Hilton, prediction of college entry or educational attainment cannot be based on high school curricula since many non-academic students went on to college and a significant number of college preparatory students went directly to work. For females, however, he found a more significant impact of curricula on educational attainment and the highest correlation between curricula and post high school outcome was that of students who pursued clerical programs and went directly to work after high school. A contradictory finding, at least in emphasis, was that the probability of entering college and graduating was directly related to students' high school curriculum (Flanagan, et al., 1971; Trent and Medsker, 1968). This latter finding may be the result of the fact that student achievement was significantly related to being in an academic curriculum rather than a vocational high school. In all four of Hilton's (1971) curricula studies, underachievers compared to overachievers did more non-school related reading in their leisure time; had fathers who did not encourage them to go to college and spent more time outside school on technical or vocational activities.

Certainly, more needs to be learned about the effect of different school characteristics on the decisions of students in this context. Schools, of course, do not merely aim to teach students how to perform well on particular standardized achievement tests--they have many aims. Thus schools may be using their resources with different emphasis with respect to cognitive outcomes. Some schools emphasize mathematics; others reading. Still others stress non-cognitive skills or behavior. Within the school, different teachers make different use of both the curriculum and the facilities of the school (Averich, et al., 1972).

Two lines of inquiry that should be pursued in this context and which were not investigated in the analytical review studies, pertain to the interaction of teacher and student and of intelligence and instructional methodology. Thelan (1967) reports direct evidence of the teacher-student interaction and describes a method by which both classroom behavior and outcome may be improved. Since some teachers do better with certain kinds of students, students are assigned to teachers they work most effectively with or learn most effectively from. More information, of course, is needed concerning the different preferences and abilities of the teacher. Research on teacher skills alone is insufficient; the characteristics of students best suited for these skills must also be considered. Clearly, more information is needed about this kind of phenomenon, particularly if it is found replicable, for the sake of the educational benefits implied.

A second, possibly fruitful, line of research which should be pursued concerns the interaction between intelligence and instructional methodology. That is, according to Cronbach and Snow (1969), instructional methods and learning tasks are differentially effective according to the level of students' general ability. Thus, high-ability students may achieve well using one instructional method, while low-ability students perform better with another instructional method.

The fact that students are often grouped in classes according to their ability is not the answer. In fact, findings discussed in the next section of this report, indicate that students do better in heterogeneous groups. What is needed is research on the differential instructional treatments of the separate ability groups.

In addition, according to Lehmann and Dressel's (1962) study, at college entry, critical thinking ability of students also differed according to type of high school attended. Students from public high schools were least stereotypic and dogmatic while students from parochial high schools were most stereotypic and dogmatic and had the highest traditional-value scores. This latter finding is not surprising in light of the previous discussion of the past characteristics of Catholic education.

It may be, then, that different types of high schools emphasize different kinds of learning in addition to different kinds of curricula, both of which, in turn, differentially affect students' personality. The complex interactions of school, curricula, and personality must be more carefully investigated before definitive conclusions can be made regarding the impact of either school or curricula on students' growth and development and college attendance.

College Environments:

When asked what factors in college resulted in high prestige among both students and faculty, both persisters and withdrawals agreed that academic values, including qualities such as originality, creativity, scholarship, and hard work were most important (Lehmann and Dressel, 1963).

Institutions which attracted the most intellectually disposed students were the independent universities; the vocational schools attracted those in the lowest quartile of intellectual disposition (Tillery, et al., 1972). However, when student inputs were controlled institutional quality did not have an effect on student achievement. Educational achievement was affected by differences that existed prior to matriculation (Astin and Panos, 1969).

In all states studied, junior colleges drew almost equally from all socioeconomic status levels, although there were less junior college students from the higher than average family income groups. Modest family income was thus less of a barrier to enrollment in junior colleges than to enrollment in senior colleges (Tillery, et al., 1972a; Trent and Medsker, 1968).

Negro students received lower quality higher education than Caucasians. They attended segregated institutions disproportionately, enrolled in colleges with lower proportions of teachers with doctoral degrees where the faculty received comparatively low salaries, were most likely to enroll in state colleges than in state universities and were frequently found in institutions with high dropout rates. The more select the institution the greater was the proportion of Caucasians in the student body. Most minority students who entered college went to junior colleges (Coleman, 1966).

Aspirations to attend graduate school also varied among different types of institutions. Students attending selective private colleges in the Northeast with high budgets and demanding work tended to have higher educational aspirations. Northeastern men's colleges and colleges in the Southwest produced significantly fewer students who aspired to the Ph.D. than would be expected on the basis of the characteristics of entering students (Astin, 1963; Astin and Panos, 1969). The largest number of graduating seniors expressing an interest in graduate school were those from private, non-sectarian universitites followed by private non-sectarian colleges, public universities, church-related colleges and state universitites (Trent and Medkser, 1968). Predominantly Negro colleges tended to facilitate students' desires for obtaining a graduate degree (Astin and Panos, 1969).

The motivation to seek advanced education was strengthened by an upper-class environment with a strong press from peers for intellectualism and peers' plans to do advanced work. In general, the students' career choice tended to move into closer conformity with the more popular career choices among fellow students. This was particularly evident in the fields of engineering, business and business law. College environments where there was considerable religious activity and little drinking tended to shift students away from careers in the arts and social sciences and into careers such as the clergy, medicine, and teaching. However, when the college environment was viewed independently of its student body, its effects on the individual student career plans appeared to be trivial (Astin and Panos, 1969).

Significant research has been done in the measurement of college environments (see, e.g., Astin and Holland, 1961; Pace, 1963, 1967), and the few findings just enumerated suggest that measurable environmental characteristics may have significant influence on student development. Much has yet to be learned, however, about the precise interacting environmental elements that have what kind of effects on what kind of students. This is true at the college level, and even more so at the precollege level where longitudinal data of this kind is essentially non-existent.

Influence of peers:

Although Coleman's findings concerning the influence of peers on minority students' achievement have been disputed on methodological grounds by several researchers (the reader is referred to section 2 Chapter II of this report and to Chapter IV of Volume III) the work of Hilton, Husen and also Newcomb and Wilson (1966) provide ample evidence of the peer group's influence on the adolescent's and young adult's behavior, whether in terms of social activities, dress, educational decisions, or goals. Coleman concluded that for adolescents, at least, peers' influence prevails over that of parents. This, however, is questionable.

As in other research, the high school seniors in the Trent and Medsker (1968) sample who were planning to attend college reported the same plans for most of their friends. But upon looking back on their lives four years later they reported their parents to be far more helpful and influential than anyone else, including teachers and friends. This was true of both those who had entered college and those who had not, but it was especially true of the college attenders. Drabick (1967), who examined this issue among adolescents in reference to educational and occupational decisions, specifically found that youths largely saw their basic decisions as their own, but parents as the most important external influence. This was also evident in Bordua's (1960) cross-tabulations which included as factors independently related to college aspirations, religious background, socioeconomic status, and parental stress.

Some research indicates that the relative influence of peers and parents on decision making depends upon the specific situation. Solomon (1961) presented a sample of adolescents with four hypothetical situations, then first asked how they would respond to them if they were "real" situations, and second whether parents, peers, and their own values, or their impulses would be most influential in their decisions. Three of the situations had to do with social behavior (going steady, breaking a friendship, attending a party, or visiting an aunt). Values and impulses were of the most influence in deciding about these situations. The fourth situation (copying) was the only one that had to do with academic (and moral) behavior and in this case parents were most influential.

Brittain (1963) conducted a similar study, presenting his sample with 12 situations through his "Cross-Pressure Test." Most of the items had to do with jobs, activities, conduct (again moral), and dress. Peer influence dominated on only three items--the two items on dress and the one having to do with which course to take (perhaps having more to do with the decision to be in a class with friends than serious educational decisions). Parents were of the most influence on the one situation having to do with academic achievement (selection for honors) as they were on all other items save one (which boy to date steadily) where influence was equal.

Simpson's (1962) study of adolescents' occupational decisions suggests a key to the relative influence of parent and peer. Parents had a greater effect on decision making though differences were not reported as statistically significant. More important, perhaps, is that aspirations were highest under the influence of both parents and peers, and lowest when neither were influential.

In other words the effect is cumulative. The probability is that parents initiate values and provide the environmental settings in which friends of comparable socioeconomic status and concomitant values will be chosen. Thus the interrelated findings that students from high socioeconomic status backgrounds are more likely to enroll in academic curricula and more students enrolled in academic compared to non-academic curricula had friends planning to go to college (Hilton, 1971). Berelson and Steiner (1964) summarize the logical result on the basis of Kahl's (1953) research to the effect that the individual's peer group "reinforces the classifying attributes and tendencies of the parental family" (p. 469). The way in which the peer group operates to reinforce these tendencies and the relative long-term impact of the peer group _viz a viz_ the family need to be more vigorously scrutinized in future longitudinal studies.

Regional and Community differences:

Just as a family can be characterized according to its socioeconomic status, so can a region or a community which represents a composition of many families, and regional differences in school facilities were striking.

Although segregation was extensive in all regions where the Negro population was concentrated, not surprisingly, segregation was most nearly complete in the South, and again not surprisingly, school facilities were poorest in the South. For example, 95% of Negro and 80% of Caucasian high school students in the metropolitan Far West attended schools with language laboratories compared to 48% and 72%, respectively, in the metropolitan South. One hundred percent of Negro and 97% of Caucasian high school students in the metropolitan Far West attended schools having a remedial reading teacher compared with 46% and 65%, respectively, in the metropolitan South and 47% and 97% in the non-metropolitan Southwest. In addition, Negro students were less likely to attend accredited high schools, especially in the South. At the same time, the relationship between achievement of Negroes and teacher qualities was over twice as great for southern Negroes compared to northern Negroes and Negro achievement was also most related to peer characteristics in the South (Coleman, 1966).

Regional differences in achievement were also noticeable. Students in the Northeast tended to have scores above the national average and students in the Southeast below that average. Differences within each region, however, were more striking (Flanagan, et al., 1964). By grade 12, both Caucasian and Negro students in the South scored below their counterparts in the North. In addition, southern Negroes scored further below southern Caucasians than northern Negroes scored below northern Caucasians (Coleman, 1966). On certain tests and at certain levels, Negroes in one town achieved higher scores than Negroes tested in another town, suggesting that specific location may also affect achievement (Hilton, 1971). The dropout rate in high schools varied according to the metropolitanism of the area as well as by whether they were located within or without the South. In the metropolitan North and West, 20% of Negroes ages 16-17 were not in school--a higher dropout rate than in the metropolitan or non-metropolitan South (Coleman, 1966).

In particular, the data indicate that college attendance followed the pattern of accessibility characteristic of the community and state. The Trent and Medsker cross-country sample of high school seniors was drawn from 17 communities. College entrance the semester following high school graduation varied by community from approximately 25 to 65%. The many community elements that may have contributed to this wide range of proportions of students who decided upon college are not clear. One element, however, is evident. The presence of a public college and the kind of college was associated with college attendance. The highest rate of college entrance occurred among students who graduated from high schools in communities with a junior college (53%); the lowest rate in communities with an extension center (34%) or no college at all (33%). Forty-seven percent of the students from communities with a state college entered college right after high school graduation (Medsker and Trent, 1965). In addition, more students from every ability and socioeconomic level entered college in communities with a junior college than in communities with any other type of college.

With 74 community colleges, 34% of California's college students were enrolled in two-year colleges in 1966, and California had a lower proportion of high school graduates who did not plan to go to college than any other state (Tillery, et al., 1972a). In the East where there were fewer extension centers and community colleges and more private colleges, fewer students continued their education after high school. Moreover, the difference between one state and another in percentage of college enrollment was greater than the difference between one sex and the other. The rate of college entrance was highest in the Far West and Southwest and lowest in the Mideast and New England (Tillery, et al., 1972a). Similar data were found by Flanagan, et al., 1971; Hilton, 1971; Trent and Medsker, 1968.

In a study conducted in Minnesota, Berdie and Hood (1965) also found that the location of students made a difference in college attendance, and this was particularly true in reference to the location of colleges. Fenske's (1966) study of graduating seniors from 10 Wisconsin communities indicated that students of a high level of both academic aptitude and socioeconomic status generally entered college regardless of the community. Although he considered that local availability of a college was relatively uninfluential upon the decision to attend college, he also concluded that:

> Local availability of a college was crucial to plans for college attendance, however, for many graduates (especially girls) with combinations of characteristics positively associated with plans for college and those negatively associated with such plans, e.g., graduates of high scholastic ability but whose parents had only a grade school education (p. 3).

It may well be that communities characterized by a relatively high level of socioeconomic status set values and standards that influence all students, even those students who are not themselves at a high level of socioeconomic status. But some of this possible influence, no doubt, depends upon the location of the community, particularly with respect to the great difference in rate of college attendance of high school graduates between rural and urban communities.

The general consensus of much of the literature is that in comparison to urban youth, rural youth have a high rate of withdrawal from high school and a low rate of college attendance. This condition has been found to exist regardless of academic aptitude, financial resources, or socioeconomic status generally (Berdie and Hood, 1965; Christiansen, 1962; Coster, 1963; Lindstrom, 1967; Sewell, 1963).

More specifically, in comparison with their urban peers, rural youth have been found to be more unrealistic in their plans and disadvantaged in their achievement, exposure to achievement-oriented values, educational aspirations, personal goals, academic motivation, and preparation for college. This has also been found to be true regardless of curricular emphasis upon college preparation or grades earned (Elder, 1963; Lindstrom, 1968; Sanders, Osborne and Green, 1955).

Generally, rural youths have been found to receive little encouragement to attend college either from their parents or schools (Shill, 1968). Further, in spite of the fact that fewer farming activities will be available in the future and that these opportunities will require a high level of skills, inadequate counseling is indicated in rural high schools by lack of knowledge of occupational training needs of rural youths (Elder, 1963; Lindstrom, 1968). Thus, communities from which the smallest proportion of young men entered the military service apparently have fairly stable economies. The highest percentage of professional workers in the Trent and Medsker sample were found in relatively small and economically depressed communities where there was a comparative lack of competition. At the same time, the highest percentage of men who were still in their home community four years after high school graduation were in cities that offered good job opportunities for young men on their way up.

In addition to the fact that schools in rural and economically depressed communities had many students with unrealistic aspirations (Hilton, 1971), critical thinking ability also differed according to students' community background. Males who lived most of their life on a farm were more stereotypic, dogmatic and traditional value-oriented. For females, there were no significant differences in stereotypy or dogmatism, but those who lived most of their life on a farm were also more traditional value-oriented. In addition, a major adjustment for many students, particularly those from rural areas was the awareness that they were not "first" any more in the academic, athletic and social competition (Katz, et al., 1968; Lehmann and Dressel, 1962, 1963).

Although there is considerable consensus in the findings reported above, they are nevertheless, superficial. That is, it is really questionable whether the location of communities are in themselves variables that determine a student's achievement, personality, or decision to go to college. Rather, it is more likely that the community or urban-rural differences found result from the quality of their secondary schools, and their cultural events that operate to influence the students growing up in these different community environments.

Before judgments are made concerning regional or community impacts on students, it is recommended that more systematic research be conducted analyzing the specific educational and cultural characteristics of given communities in addition to the characteristics of the families residing within them.

Chapter 5.

ACADEMIC APTITUDES AND ABILITIES

The study of human abilities has for some time been an area of concern for research psychologists concerned with individual characteristics. Schools, too, have continuously been concerned with students' abilities, particularly, their aptitude for the acquisition of cognitive skills and knowledge, and employ at various times IQ tests, aptitude and achievement tests and grade point averages as measures of students' educational growth. Each of these measurements has been the subject of much controversy, and only brief mention of their limitations will be discussed here. More fundamental to the task of the synthesis, however, is the fact that the problem of understanding the process of acquiring knowledge, as measured by achievement tests, and the measured abilities and personality characteristics of students is complex, and apparently relatively little headway toward understanding this process has been made.

Although intelligence or "academic aptitude" may be at least in part genetically determined, it is not necessarily static. There are dramatic increases during childhood in the ability to perform many kinds of tasks that require reasoning, memory, judgment, and perceptual and motor skills. In fact, between the ages of 6 and 18, 60% of the Berkeley growth samples studied by Jones, et al. (1972) changed 15 or more points; 33% changed 20 points; 9% changed 30 or more points; and only 15% showed less than a 10 point change. In addition, there were large individual differences in the time of life at which a maximum of measured ability was reached. Intellectual potential for continued learning and mental growth was unimpaired through age 36, especially in the attainment of information and word knowledge.

A number of test-retest studies of growth in mental abilities demonstrated that the more intelligent subjects at any age in comparison with less intelligent persons of the same age, were not only increasing in measured ability at a faster rate, but they were also further both in time and amount of ability from their point of maximum ability (Jones, et al. 1972).

Thus, not only do individuals differ widely in intelligence, they differ widely in their rates of intellectual or mental growth and it is essential for educational policy to determine which factors facilitate or, conversely, which impede students' mental growth.

Some clues may again be found in early childhood behaviors and parental behaviors and attitudes. Kagan and Moss (1962), for example, found that achievement behavior and intellectual mastery in childhood were highly correlated with achievement, intellectual mastery, competence, and IQ for both male and female adults. At the same time, as previously mentioned several maternal behaviors correlated with achievement behavior in children and adults. In addition, mother's energy, defined as responsiveness to the child's needs, correlated positively with the child's mental growth while energy level of father correlated negatively with intelligence test scores of both males and females (Jones, et al. 1972). Apparently, parental behaviors, particularly those of the mother, influence the child's mental growth and development as well as his psychological growth and personality characteristics.

Project TALENT (Flanagan, et al. 1967) found that mental growth in high school occurred in all areas tested, but the larger gains tended to be associated with school-taught subjects. The implications of these findings for schools are major and the implications for research equally monumental. Since increases in mental ability may be anticipated for students throughout high school and college, it is imperative that the kinds of instructional practices, the subject-matter content, the teaching styles of teachers, indeed a whole array of instructional variables, be analyzed in terms of their effect on mental growth.

Within this context, several findings from Project TALENT are disturbing. The average high school student was found not able to solve simple reasoning problems as well as he memorized and applied simple rules such as the rules of capitalization. Flanagan, et al. (1967) also found that less than 20% of the reading comprehension and abstract reasoning variances typically were subject to modification during the high school years and even smaller percentages of arithmetic reasoning and vocabularly were subject to change. This does not mean that such abilities cannot be modified, only that they were not shown to be modified by the Project TALENT schools. In addition, 20-30% of high school students in grade 9 knew more about many subject matter fields than did the average student in the 12th grade although, in general, variability within grades was greater than variability between grades.

One likely reason that students perform better on tests of memorization is that they are taught how to memorize, to recall facts. Schools must re-examine their objectives and determine if they are really teaching students how to reason, analyze, and think critically. The evidence here suggests they are not. These findings could be interpreted as a major indictment against the schools. However, the relationship between academic ability, measured by IQ tests, and performance on standardized achievement tests is still unclear.

Indeed, many of the criticisms raised against the standardized achievement tests are also pertinent to IQ and aptitude tests. Many psychologists contend that IQ tests are, in fact, primarily achievement tests, measuring what the individual has learned, not his capacity for learning.

In addition, IQ test scores also reflect environmental and thus cultural influences. The interaction of social values and goals exert a powerful influence on the test content, scores, and interpretations of both IQ and achievement tests. According to Jensen (1970):

> It should not be forgotten that intelligence tests as we know them evolved in close conjunction with the educational curricula and instructional methods of Europe and North America . . . and bear the imprint of their origins in predominantly aristocratic and upper-class European society . . . If the educational needs and goals of this upper segment of society had been different, and if their model pattern of abilities--both innate abilities and those acquired in these peculiar environmental circumstances--were different, it seems a safe conjecture that . . . our intelligence tests--assuming we have them under these different conditions--would most likely also have taken on a different character.

Although many of Jensen's statements are open to question, it does seem clear that findings based on standardized achievement tests and IQ tests must be interpreted with caution. For example, according to Flanagan and his associates, gain scores on a series of achievement tests obtained between grades 9 and 12 revealed that two variables, Abstract Reasoning and Vocabulary together accounted for much of the general ability factor entering into the grade 12 scores. At the same time, however, differences in the relative levels of information an individual displayed often reflected his pattern of interests more than his abilities. Interest in mathematics was clearly related to mathematical ability in all elementary and secondary school samples (Husen, 1969).

Not only does the problem of interests confound interpretations of findings based on aptitude and achievement tests but the use of gain scores may result in extremely biased estimates of true gain. The reader is referred to Chapter V of Volume III of the Analytical Review for a more comprehensive discussion of such statistical problems.

A further problem in interpreting and, in fact, delineating a "pure" aptitude factor is the confounding relationship between academic aptitude, curriculum, and socioeconomic status. For example, from the 7th grade on, students who were to later choose academic programs had significantly higher scores on ability and achievement tests than students who later entered non-academic programs (Flanagan, et al. 1964, 1967; Hilton, 1971), whereas students who later chose vocational curricula achieved higher scores on tests of science aptitude than students who selected other non-academic programs and also maintained this lead. Students who later dropped out of high school obtained scores on ability and achievement tests which were significantly lower than students who continued through the 11th grade (Hilton, 1971). In general, high aptitude high school students compared to low aptitude students tended to have started school earlier, to have enrolled in college preparatory courses to a greater extent, to have spent more hours per week studying and to have aspirations for obtaining more education (Flanagan, et al. 1964).

However, as was discussed in the previous section, each of these factors (choice of curricula, achievement, aspirations, etc.) are also related to socioeconomic status. Thus, several questions can be raised regarding the above findings. Were students "tracked" into the college preparatory curricula by high school counselors? Were they encouraged to enroll by their parents? On the other hand, were lower ability students discouraged by school officials from enrolling in academic curricula? Do low aptitude students have low self-concepts of their ability to complete college preparatory programs and thus are reluctant to take the risk of failing?

Without a doubt two of the most important determinants of persistence through high school and college attendance are intelligence, or academic aptitude, and socioeconomic status. But just as it is essentially impossible to consider these variables apart from each other in relation to college attendance, neither do they together or independently represent the sole determinants of educational progress. The interrelationships are probably as important as their individual influences on finishing high school and the decision to attend college, if not more so.

College attendance, as such, occurs with greater frequency at the higher levels of socioeconomic status and academic aptitude as previously indicated; but so, too, do achievement motivation and aspirations. There was a significant and positive correlation between intelligence test scores and educational and vocational aspirations. Not only were plans to enter scientific or technical occupations consistently related to mathematics scores, but college students with higher grades tended to be interested in biological sciences, engineering, physical sciences and mathematics; students with poorer grades tended toward business and education (Bachman, 1970; Thistlethwaite, 1965; Trent & Medsker, 1968).

A high level of educational aspiration was, in turn, associated with a high grade-point average and high intelligence and academic aptitude test scores in high school (Astin & Panos, 1969; Bachman, 1970; Flanagan, et al. 1964; Lehmann & Dressel, 1962, 1963; Thistlethwaite, 1965; Trent & Medsker, 1968). A greater proportion of high school graduates at a high level of academic aptitude who could be expected to attain a professional occupation or career desired to do so, and high aptitude students who attended college desired a professional vocation in greater proportions than their high aptitude, non-college attending peers (Trent & Medsker, 1968). Attitudes toward the self, toward others, toward the future help shape students' aspirations all of which in turn influence and are influenced by aptitude. Thus, it is not surprising to find that all of these variables interact with ability and aptitude.

Academic aptitude was found to be a good predictor of career choices in some fields; college students with superior academic records were more likely to make stable career choices and to end up choosing careers in college teaching, law, physical science and medicine (Astin & Panos, 1969). Thus academic aptitude was a significant predictor of both males and females' disposition to and actual entrance in graduate school (Thistlethwaite, 1965; Trent & Medsker, 1968).

In addition, wisdom of vocational preferences, defined as agreement between students' actual and needed abilities for various occupations was not related to level of occupational attainment and only slightly related to occupational satisfaction. Intelligence and grade point average in both junior and senior high school, however, were consistently good predictors not only of stabilizing job behaviors such as realistic reasons for changing job positions, improvement in educational status and educational and vocational levels attained, but also of occupational satisfaction at age 25 (Bachman, 1970; Super, 1967). Moreover, the rate of unemployment during the first four years after high school graduation was highest for men at the lower level of academic aptitude (Trent & Medsker, 1968).

Also many high school seniors were unrealistic in their career and thus educational plans with large percentages expecting to enter a professional or technical field (Flanagan, et al. 1964; Hilton, 1971; Trent & Medsker, 1968), and this remained the case for high school graduates who went on to two-year colleges (Trent & Medsker, 1968). In fact, although 73% of the high school males and 58% of the females expected to attend college at some time, only 49% of the senior males and 35% of the senior females actually enrolled in college within a year after graduation. Planning to go to college, however, did not appear to have any great effect on 12th grade achievement and aptitude scores aside from its motivational factor in a student's choice of classes (Flanagan, et al. 1967).

Nevertheless, proportionately more students with high aspirations report satisfaction with their high school experiences, in general are more optimistic, energetic, involved in and assert responsibility for control over their own destiny, discuss school with their parents and view their parents as helpful, have greater critical thinking ability at college entrance and have greater self-confidence and certainty about graduating from college (Lehmann & Dressel, 1962; Tillery, et al. 1972b; Trent & Medsker, 1968).

The evidence is also considerable that a high level of educational aspiration is associated with a high grade point average, and high intelligence and academic aptitude test scores in high school (Astin & Panos, 1969; Bachman, 1970; Flanagan, et al. 1964; Lehmann & Dressel, 1963; Thistlethwaite, 1965; Trent & Medsker, 1968). The level of mathematics achievement, specifically, was also found to be positively related to level of educational aspirations and, in particular, to aspirations for scientific or technical occupations (Husen, 1969). Aspirations, of course, reflect attitudes, and it has already been mentioned that students' attitudes had a stronger relationship to achievement than all the school characteristics combined.

Academic aptitude was significantly related to graduation from a four-year college within five years after high school matriculation (Astin & Panos, 1969; Flanagan, et al. 1971; Trent & Medsker, 1968). But, although the most important single determinant of level of achievement as a college senior was academic ability during high school (Astin & Panos, 1969; Hilton, 1971), mathematics aptitude in college was the best predictor of subsequent level of natural science achievement, and academic aptitude did not account for most of the college withdrawals (Trent & Medsker, 1968). In fact, although aptitude was related to persistence in college, a vast majority of persisters' and withdrawals' academic aptitude scores overlapped. However, less than 7% of the persisters were at the low level of ability compared to 15% of the withdrawals, but 44% of the males and 46% of the females who withdrew were at the high level of academic ability (Trent & Medsker, 1968).

It is important to keep in mind that measures of ability reflect only part of the individuals' personality, and growth in ability is only a small part of the total growth in individual experiences. According to Trent (1970), over 90% of students at both the upper quartile of ability and socioeconomic status have been found to enter college. Still, many talented youth do not attend college, and presumably motivational factors account for much of this slippage, although they cannot be extricated from ability and socioeconomic status any more than these two latter factors can be separated from each other.

Chapter 6.

ASPECTS OF PERSISTENCE

Most of the research covered having to do with persistence in education concerned college students. Out of a wide array of variables individual items most predictive of college entry and persistence were students' perception of the importance of college and their certainty of graduating from college. Eventual persisters compared to withdrawals and particularly non-attenders reported as high school seniors: college to be "extremely important", to be certain of graduating from college, and to have primarily academic reasons rather than vocational or other reasons for attending college. They also reported far more encouragement to graduate from college from their parents compared to withdrawals, and especially compared to high school peers who did not attend college (Trent and Medsker, 1968).

Socioeconomic status and academic aptitude were other, anticipated factors found related to persistence in college, although there was considerable disagreement in the research as to the strength of these relationships (see, e.g. Astin and Panos, 1969; Flanagan, et al, 1967; Trent and Medsker, 1968). Two other important predictors of undergraduate persistence and achievement were students intended field of study and career choice at time of matriculation. Although about 75 percent of students changed their career plans after entering college, ranging from less than 50 percent of those in nursing and teaching to over 90 percent of those initially in mathematics, government and diplomatic service, the best predictor of final major field and career choice was initial choice (Astin and Panos, 1969).

Students who declared business/secretarial or engineering majors when entering college were more likely to drop out than students declaring other majors. Students at liberal arts colleges tended to switch out of business, education and engineering and into art, humanities and social science. They also exhibited less interest in law and more interest in physical science, social science, medicine, and college teaching. Students who intended to major in biological science or psychology entered with and maintained higher aspirations than those in other fields, and the greatest increase in aspirations was exhibited by those graduates with degrees in social science, education and miscellaneous fields (Thistlethwaite, 1965).

The evidence indicates that although only 50 percent of those completing four years of college work obtained a baccalaureate degree during this time, in general, persistence varied according to the type of institution attended. For example, if a student attended a relatively select institution where the number of employed students was low and the peer environment cohesive, he was relatively more likely to persist and obtain a degree than if he attended a large university. Attendance at a university tended to increase a student's chances of dropping out. However, both males and females were more likely to drop out of college if they attended a coeducational institution where there was a high frequency of informal dating (Astin and Panos, 1969). Persistence in college was lowest for two year college students, highest for students in church-related colleges and somewhat higher for "native" students than for transfers from two year colleges. Attendance at Catholic institutions increased a students chances of persistence and completion of a degree (Astin and Panos, 1969; Trent and Medsker, 1968). It should be noted, however, that, at least for senior college students, of those who dropped out of their first college, more than 50 percent enrolled at a second institution. Indeed, research on students who have withdrawn from relatively select universities indicates that most of them obtain their baccalaureate degree within an eight year period (see Suczek and Alfert, 1966; Eckland, 1964). Moreover, we should not automatically assume that withdrawal from college represents failure or maladjustment. Some students may withdraw simply because they have obtained the academic or personal satisfaction they sought. For others withdrawal may be a positive and healthy solution to problems of an academic, social or psychological nature. Also, some students who withdraw return at a later time in their life to finish their education.

According to Sanford (1956):

> ...increased knowledge of the withdrawal phenomenon might quite conceivably, lead to the conclusion that the college should have more rather than fewer dropouts; perhaps too many students were remaining in the college after they reached a level of maturity such that further growth could only be stimulated elsewhere; or perhaps the admission of more students of the type who tended to drop out would be a means for changing the college in some desired way (p.650).

In general, there has been little discussion in the research reviewed, of the implication of the available data on students for college objectives or institutional practices pertaining to persistence and withdrawal.

Chapter 7.

VOCATIONAL INTERESTS AND EXPERIENCES

Few people today will dispute the fact that college has become the gateway to much of the occupational world, particularly to the professional and higher managerial status. Increasingly, it is difficult for a man or woman without college training, regardless of his or her intellectual capabilities, to obtain good positions and especially to rise in status in the established business world.

This situation is exerting a powerful influence on the orientation of millions of young people approaching college age. Parents, teachers, and guidance counselors are constantly impressing upon them the indispensibility of a college education and the proper credential for a respectable and thus satisfying status in life (Beardslee & O'Dowd, 1965).

In view of these factors, one might expect to find an extensive literature concerning the vocational interests, attitudes and outcomes of high school and college students. Yet, aside from Super's (1953 to 1967) vocational development study, relatively little has been written concerning the influence of career aspirations on the performance and activities of students in and out of the classroom.

At the same time increasingly larger percentages of young people work during and immediately after high school. According to Project TALENT's data, only 21% of the males and 29% of the females did not hold at least one full-time job in the year following high school. Forty-four percent found their first full-time job before they left high school; only 7% took more than 6 months to find a job.

One might expect to find that these work experiences affect students' vocational development but, according to Super, they do not. Specifically, the nature of senior high school work experience was not related to post-high school career development or occupational satisfaction. Even being self-employed while in high school was only slightly related to the career satisfaction of his subjects at age 25. Junior high school work experience, however, may be related to less post-high school education.

In addition, participation in activities relevant to vocational interests, both in and out of high school, was not related to later occupational attainment. Participation in avocational activities, however, both in and out of school, was consistently related to several of Super's vocational criteria: realistic reasons for changing jobs and stabilizing and floundering career behaviors.

Vocational aspiration level, maturity of interest in the 12th grade as well as information obtained in high school concerning the educational and training requirements for all occupations of interest were good predictors of realistic reasons for changing jobs, improvement in educational status and occupational level attained by Super's subjects when they reached 25 years of age. In addition these factors plus level of vocational attainment were positively related to self-estimated career satisfaction.

High school curriculum was consistently related to realistic reasons for changing jobs and in one sample predicted stabilizing behaviors. It was also related to occupational level attained and occupational satisfaction (Super, 1967) at age 25. In fact, of all students surveyed by Hilton (1971), vocational students indicated the most interest in their courses and considered vocational courses the most useful. However, according to Katz and associates (1968), once in college, students' vocational orientation may be the strongest influence working against the liberalizing effects of the curriculum, since it prevents testing of educational and occupational preferences and goals.

Most of the research on the influence of courses and curricula, however, fails to take into account the motivating force of vocational interests and conversely, the lack of such motivating forces. For many students, the occupational world is the central means by which they will reach desirable goals. For others, less aware of or less interested in social mobility, the occupational world is unreal. Super (1967) in fact suggests that locating a place in the world of work represents in part an attempt to implement one's concept of self as well as a means of refining and extending it. Thus, in Super's system, the self-concept is a series of hypotheses about the self which must be systematically tested and adjusted according to the reality of the specific occupational role.

Considering the interrelationship among self-concept, aspirations and college attendance, then, it is not surprising to find that large proportions of students who did not attend college were unable prior to high school graduation to state a vocational choice of any kind and most, particularly the women, who did state a choice were vague about it or indicated unrealistic goals (Tillery et al., 1972; Trent and Medsker, 1968). Proportionately more individuals who attended some form of post high school, junior college, or vocational school reported a higher level of vocational aspiration than did those with no post high school training; high academic aptitude students who attended college desired a professional vocation in greater proportion than did their high aptitude noncollege peers (Super, 1967; Trent and Medsker, 1968). The differences in the career goals of bright non-attending males compared to their short-term college attending peers, however, did not account for the non-attenders decision not to enter some form of vocational training.

Several studies point to the relationship between occupations and psychological need (Bordin, 1943; Roe, 1956), and it may well be that personality characteristics and varying levels of personal growth and mental health as well as motivational factors are involved in these varying levels of vocational aspirations.

According to Hollingshead and Redlich (1958), the esteem in which a career is held has a greater effect than its material rewards on the emotional stability of people identified with it. Perhaps the low vocational aspirants wish to have a highly esteemed career but lack the ego strength to risk the academic pressures of college necessary to obtain it. Erickson (1956) suggests the alternative to the establishment of a sense of identity is the development of a sense of self-diffusion which manifests itself in a purposelessness, an unwillingness to be productive and an inability to commit oneself to anyone or anything.

Trent and Medsker's findings seem pertinent in this context. As a group, those who entered employment compared to those who persisted in college were more religious in orientation, showed less interest in intellectual inquiry, were less intellectual and aesthetic in orientation, less interested in reflective thought, less autonomous and less socially mature.

By four years after high school graduation, 46% of non-college men and 36% of college withdrawals entered military service (Flanagan et al., 1971; Trent and Medsker, 1968). Men who went to junior colleges or to special schools with specific vocational orientations attained higher occupational levels than did men who had no post high school training or training limited to military service. Among the men, those who entered military service were the only ones who were represented by a majority at the semi-skilled and unskilled occupational levels.

It should be kept in mind, however, that many men who serve in the military attend college later in their adult life, and it is not possible to determine from these data if the vocational attainment and personality characteristics of these men changed as a result of their later college experience.

Nevertheless, positive vocational movement was clearly related to attainment of higher levels of education. Proportionately more men with some college experience compared to their non-college peers held a business-oriented job and fewer industrial trade jobs four years after high school. Most of the men without college experience were limited to factory jobs; most women to clerical jobs. They did not prefer these jobs and were not happy, but had not changed or improved them. Although a considerable majority of college men worked in some area classified as low level technology proportionately more college non-attenders than withdrawals experienced unemployment (Flanagan et al., 1971; Trent and Medsker, 1968). At the same time more college persisters than non-college men felt liking their work was important for job satisfaction; more non-college men felt steadiness of employment was more important for a satisfying job (Trent and Medsker, 1968).

Apparently, the interests and attitudes toward the career world that students express reflect, in great part, their personal characteristics, particularly for many, their lack of confidence in themselves. Recognizing this fact, the schools could do much to help students develop personal attributes that will strengthen their identity and thus increase their ability to explore many career alternatives.

Chapter 8.

PERSONALITY TRAITS AND MOTIVATION

Whether personal characteristics and dispositions determine subsequent behavior, achievements and success, or vice versa, is still uncertain although the evidence seems to be in favor of the former. As has been noted in a variety of ways, the unique environmental press exerted on youths is bound to be manifest in their personality and behavior. Those who end up deciding to go to college exhibit greater motivation to achieve, greater self-esteem, and greater strivings for independence.

The Meaning of Motivation

Clearly student attitude and motivation are major determinants of achievement level. As a matter of fact, Havighurst and Neugarten (1967, p. 99) argue that "The most important factor in determining who will go to college is that of motivation, the individual's desire for a college education". Havighurst and Neugarten consider that motivation to attend college arises from four major factors: (1) need for achievement; (2) identification with persons who have gone to college or done well in school; (3) social pressure, especially from family, peers and school; and (4) intrinsic pleasure in learning.

Havighurst and Neugarten's four factors actually provide a good beginning operational definition of motivation. The factors gain in viability since many aspects of the factors have been demonstrated in the research reviewed to this point. Yet the term "motivation" has various meanings in the literature. Ideally, therefore, an examination of a comprehensive conceptualization of motivation should be developed before more specific attention is given to the dynamics of academic motivation.

A sufficient description of such a conceptualization, however, would constitute yet another treatise. For the immediate purposes motivation is viewed classically as a need or desire accompanied by the intention to attain a goal that will satisfy the need; it is an internal state that controls behavior, determining the strength and specificity of action in the face of presumed alternatives (cf. English & English, 1961; Krech & Crutchfield, 1962). Achievement motivation, apparently, is a particularly persistent personality characteristic (Ryder, 1967). However, the antecedents of achievement motivation are not clear. According to one source, it is related more to cognitive maturation and innate behavior than to early experience or child-rearing practices (Heckhausen, 1967). According to other sources (e.g. Dahlstrom, 1970; Kagan & Moss, 1962) achievement motivation is related to parental and social rewards and punishments and early childhood behaviors of autonomy. Expectancy is distinct from motive in that it is an anticipation that an act or behavior will lead to a particular consequence; the strength of expectancy depends on the subjective probability of anticipated consequences. Incentive is also distinct from motive in as much as it constitutes the relative attractiveness of a reward or goal, the strength of which depends on the difficulty of attainment. Motives are relatively stable and general characteristics of the personality; expectancies and incentives are variables that depend more on the ongoing experience of environmental cues (cf. McClelland 1955; 1961). In actual practice, the three variables are interrelated, and this is certainly true regarding motivation toward academic achievement.

The important point of this discussion is that the will to persist through high school and the decision to go to college are likely to be the result of motivational needs of long standing. The expectancies of the consequences of graduating from high school, going to college and the incentives that college represents prompt the act of entering and persisting in college. But the incentives and expectancies--the act of college entrance itself--are the reflections of more basic motivation; they are the manifestation of established consistent behavior. The motivations behind the behavior are the result of selective rewards, inculcated values, and interactions from earliest childhood and, therefore, are highly stable and resistent to change.

This suggests why remedial programs designed to stimulate motivation to achieve academically generally result in such moderate or negligible success. It also suggests why students who are not sure about their college plans and who decide to enter college only late in high school or after their graduation usually end up withdrawing from college (Trent & Medsker, 1968). Although the research does not clearly distinguish motive from incentive or expectation, it does do much to substantiate Havighurst and Neugarten's conclusion that it is basic motivation, above all, that determines the decision to progress in school and college. It also gives some indication of how this motivation is formed and manifest.

Motivational Determinants. Motivational elements underlying the decision to achieve academically and enter college frequently appear in conjunction with other variables. They may also be the result of the early socioeconomic and especially familial environment. Yet apparently motivation provides the catalytic force behind the decision to attend college. Motivation is manifest in the form of a variety of attitudes and perceptions, a number of which were evident in research cited previously. Some of these same motivational variables together with some additional variables have also been observed in the comprehensive studies of Coleman (1966) and Tillery and associates (Tillery, 1969a, 1969b, 1969c; Tillery, Donovan & Sherman, 1969: Tillery, Sherman & Donovan, 1968; Tillery, et al. 1972a & b).

The main objective of Coleman's study was to assess the quality of educational opportunity in the United States. A secondary but very relevant objective was to assess the motivational-personality factors of students related to school achievement. Findings pertinent in this context are summarized below:

1. Negroes and other minority groups showed a much lower sense of control of their environment than white students. White students showed internal control responses two to three times higher on items such as "Good luck is more important than hard work for success."
2. Students' attitudes accounted for the largest proportion of the variance in school achievement, followed by socioeconomic status.
3. The educational background and aspirations of fellow students appeared to be beneficial to achievement, independent of a given student's own background. The achievement level of fellow students also had affected the achievement of a given student.
4. Positive self-concept, positive attitude toward school, interest in school and internal locus of control were predictive of academic achievement, with attitudes and background accounting for approximately 16 and 28% of the total variance for black and white students respectively.
5. Self-concept and achievement were most highly related for students of high socioeconomic status; locus of control and achievement were most closely related for "disadvantaged" students.
6. Parents' desire for their children's further education constituted the greatest unique contribution to positive self-concept and internal locus of control.

The implications of the findings are that family background is very important to the motivation to achieve, and this influence does not diminish over time; the social context, particularly the peer group, is also important;

school characteristics account for very little of the variance in school achievement; attitudes, however, are "extremely highly related to achievement." Out of the composite of variables examined, self-reported aspirations and motivation, sense of realism, self-esteem, and sense of control over the environment comprised student attitudes indicative of motivation and correlated behavior and values, and accounted for more variation in achievement than any other variable in the survey.

Consistent with expectations raised in this report, these attitudes were largely family rooted, even if measured as distinct from the family. As such they were subject to little modification in the school. In Coleman's words:

> Taking all these results together, one implication stands out above all: that school brings little influence to bear on a child's achievement that is independent of his background and general social context; and that this very lack of an independent effect means that the inequalities imposed on children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront adult life at the end of school (p. 325).

The research of Tillery and his associates (1972a & b), like that of Coleman, pertains to most of the areas covered in this report, and gains in importance in as much as the main objective of the research is to delineate the process of decision-making that results in college attendance. The findings also gain in importance since they are based on random samples of ninth and eleventh graders in four states (representing different regions and higher education systems) who were followed up on a longitudinal basis. To summarize a few of the pertinent findings:

1. High academic and vocational aspirations greatly distinguished among those who were college-bound and those who were not. Most of those who entered college did so right after high school. Those who entered four-year colleges manifested the highest aspirations in high school, and indicated early motivation by their early decision to enter college.

2. Those who aspired to enter college indicated their greater motivation by such behavior as talking about college much more, by seeking advice about college from parents, counselors, and teachers, by exhibiting greater self-confidence that they would achieve in college, by considering college an important factor in their lives, and by expressing greater interest in ideas and personal autonomy -- traits conducive to persistence in college (cf. Trent & Medsker, 1968).
3. Further indication of the relative seriousness of motivation for the college-bound was the fact that they were considerably more likely to see college as an opportunity to get ahead, in contrast to the noncollege students who were more likely to see college as a place to have fun before settling down or as a place to behave in ways that would cause their parent's disapproval.
4. Both academic aptitude and socioeconomic status were related to level of aspiration and actual attendance in college, but the economic factor as such was not a key element in college plans.
5. Parents were perceived as the greatest source of help, followed by counselors, particularly among the college-bound.
6. Counselors reportedly gave the greatest part of their attention to high aspiring, high socioeconomic, and high achieving students. Students of low aspirations tended to have a negative view of counselors and in large proportion reported being discouraged by their parents.

Once again, the convex of the data focuses on aspects of family-rooted motivation as underlying the decision to attend college. When the disposition toward college is present, the school reinforces it, but when it is lacking, it appears to ignore it. To all appearances, though, a syndrome of motivational elements is pivotal to the decision, and parents are primary in initiating that syndrome. Therefore, it is relevant to consider how parents inculcate this form of achievement motivation.

Formation of Achievement Motivation. The research does not agree on all particulars, but the consensus is that motivation to attend college begins very early in life, and even the specific decision to attend a college generally is made before the junior year of high school. Grant (1968), comparing the post high school plans of Utah high school seniors in the fall and spring, found them to be more realistic just prior to graduation. Tillery (1969b), found that approximately half of his four-state sample of high school students reported that they decided to enter college late in high school, although there was a tendency for students who entered four-year colleges and universities to decide upon college early in life. The largest proportion of students in the Trent-Medsker (1968) cross-country sample, however, who went on to enter and persist in college, reported as seniors in high school that they made their plans before their sophomore year of high school.

Interview data from students representative of this sample indicated that the college-bound had essentially taken it for granted that they would enter college from childhood, rather than having made some major, specific decision to enter college as adolescents. The observations of Douvan and Kaye (1962) also were that upper and upper-middle class students do not really make a decision about college attendance; rather, it is assumed. Their conclusion was that such students will not attend college only if they are highly motivated not to attend. Seron's (1967) review of relevant literature also reveals that the motivation or decision to enter college generally begins before high school.

Indeed, both capacity for academic achievement and motivation to achieve are observable from the earliest years of school. Kagan & Moss (1962, p. 152) concluded that they could make "fairly accurate guesses about intensity of strivings for intellectual competence in high school and college from the child's behavior or tested intelligence in the third and fourth grades." The degree of achievement behavior of ten year-olds formed good predictions of adult achievement. Three factors contributed to the "stability" of this behavior: (1) approval or acceptance of achievement by the social environment; (2) "mastery behavior" leading to status, parental, or parental surrogate acceptance, material reward, personal satisfaction, vocational satisfaction, and feelings of adequacy and competence; and (3) the educational level of the subjects' families.

Similarly, the Hoffmans (1966, p. 281) concluded from their review of the research that intellectual tendencies become fairly well consolidated by elementary school age, that measured intellectual capacity is capable of change, and that these changes "may be related to the degree of independence and achievement motivation fostered by the early family environment." Berdie & Hood (1965) concluded that influence governing post high school plans are identifiable before the ninth grade. More specifically, Shaw & McCuen (1960) identified underachieving behavior that would limit college plans among bright students as early as the first grade.

Considerable research permits much more to be said about the transmission of values that contribute to academic motivation and the related decision to progress through high school and enter college.* To summarize, this research indicates that:

1. As noted earlier, socioeconomic status interacts with family characteristics in the promulgation of achievement motivation. Children from middle-class homes seem to learn to value praise by adults (their parents) early. This

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* Berelson & Steiner, 1964; Brackbill & Jack, 1964; Douvan & Kaye, 1962; Hoffman & Hoffman, 1966; Kagan & Moss, 1962; McCandless, 1961; Sampson, 1962; Sechrest, 1962; Stinchcombe, 1969; and Terrell _et al._ 1959.

value system transfers to the school setting and contributes greatly to middle-class children's success there, and may still be operating when they reach college. Lower-class children, on the other hand, typically experience adult approval in the home only rarely, and as a result do not respond to teacher praise which for them has little meaning or value. Recent evidence indicates that lower socioeconomic status parents desire more education for their children than in the past, but they do not sufficiently nourish the motives and skills necessary for their children to compete with their higher status peers. Working-class children respond less consistently than middle-class children to achievement cues, abstract standards, and verbal rewards.

2. Serious, intellectual goals are atypical reasons for college attendance, especially among lower-class students. A more common reason for college attendance is the desire for both social and vocational mobility; college can have a high incentive value for students motivated strongly toward independence and mobility. Men phrase college aspirations in terms of vocational aspirations although for women college is more an end in itself.
3. Teachers, counselors, unrelated adults, peers, close friends, older siblings, their peers, and especially parents influence the decision to attend college. This influence often occurs by the encouragement of values and attitudes not directly related to college but which are highly conducive to college attendance; an example is the encouragement of a pervasive achievement motivation.
4. Parental demand and reward for achievement is a marked middle-class characteristic which follows a predictable pattern. The earlier that parents press for achievement among their children, the more they press for their children's independence in achievement, and the more they reward this behavior with physical affection, the greater their children's need for achievement.

5. A number of antecedents conducive to achievement motivation or needs are consistently evident and include style of familial interaction and the delegation of responsibility, apart from demand for achievement and encouragement of independence as such. Rapport with parents is important, especially with the mother and when the father is present as a respected head of the household. It is important that parents are autonomous and egalitarian; that they are relatively unrestrictive and avoid overprotectiveness without being excessively lenient; that they allow their adolescent children some power to govern their own affairs, and guide them in the use of this power in a spirit of warm permissiveness.
6. The middle-class familial syndrome for achievement orientation includes as important elements autonomous parents who are close to their children and accepting of them while at the same time pressing them toward achievement, independence, and self-responsibility. The authoritarian rather than the autonomous syndrome has the opposite effect. Authoritarian parents, especially authoritarian, coercive fathers tend to have children who, compared with children of parents who value personal autonomy, are less motivated to achieve and to continue their education.
7. There are a number of characteristics that distinguish authoritarian from autonomous families which may help to explain differences in achievement motivation among their children. Authoritarian parents are prone to discipline their children harshly, to give them their love conditionally, and to encourage their dependency through a hierarchical family structure. Autonomous parents tend to control their families democratically, to show consideration and consistency in rule enforcement, to share decision-making, to explain the reasons for their decisions, to train their children for self-reliance, and to accept the gradual detachment of their children from them.

8. Data suggest that autonomous, achievement-oriented families have a direct effect on their children's decision to attend college in as much as college-bound youths compared with others are more independent, are more self-reliant, and resist authority more. This is true particularly for men, and even more particularly for lower-class men, who may be making special efforts to assimilate the values of their achievement oriented, middle class reference groups.
9. The behavior of authoritarian families encourages dependency, and that of autonomous parents, self-esteem and self-confidence. The traits of self-esteem and self-confidence are related to achievement in school, positive interpersonal relations, and competency in general. Correlated leadership, extracurricular participation, sociability, and freedom from conflict with authority, as noted earlier, are also related to positive socialization and academic motivation and accomplishment. This important syndrome of traits of emotional acceptance, academic motivation, perceived competence, and social power determines the child's place in class. This syndrome is observable and consistent from the early years of school -- when its observation is most important since it will also ultimately determine the child's position in society as an adult.

Additional Personality Traits. As has been noted in a variety of ways, unique environmental press on youths who end up deciding upon college is bound to be manifest in their personality and behavior. This has been indicated by their greater motivation to achieve, their greater self-esteem, and greater striving for independence.

The effects of environmental press are also manifest in personality traits and self-concepts related to disposition toward learning and the larger social environment outside of the family and close peer groups. For example, almost one-third of the high school students who scored in the lowest quartile on an intellectual disposition test neither planned to go nor went to college; almost half of the students in the highest quartile of this test enrolled in 4 year institutions (Tillery, et al. 1972a & b). In addition, choosing between going to college to develop a philosophy of life versus preparing for a job was not an immediate concern of high school seniors. They had either dealt with this problem earlier or expected to deal with it in the future. In fact, there was a negative relationship between the immediacy of this problem of choice and educational aspirations (Tillery, et al. 1972b).

In an early study that formed the base line for Trent & Medsker's (1968) cross-country longitudinal sample referred to earlier, Medsker & Trent (1965) administered five preliminary scales from the Omnibus Personality Inventory (Heist & Yonge, 1968) to their subjects while high school seniors with these results: (1) as measured by the Complexity scale, for both sexes there were small but significant differences in intellectual curiosity, openness to the novel, and tolerance for ambiguity in favor of the college-bound compared with their peers who did not enter college the fall term after high school; (2) the college-bound manifested less measured anxiety; (3) the college-bound were more autonomous, objective, open-minded, culturally sophisticated, and intellectual in their thinking as measured by the correlated Nonauthoritarianism and Social Maturity scales; (4) the college-bound manifested a greater preference for abstract, reflective thinking especially in the areas of philosophy, literature, art, and music; (5) statistically significant differences between the two groups on these highly reliable and validated scales generally prevailed when controlling for level of academic aptitude and socioeconomic status, although there was some interaction among the variables (see Trent & Medsker, 1968); (6) the Thinking Introversion, Complexity, Nonauthoritarianism, and

Social Maturity scales (measuring intellectual interest, tolerance for ambiguity, and open-minded autonomous thinking) were subsequently found to be part of the select variables that formed two discriminant functions that predicted patterns of college attendance (or non-attendance) over a four-year period.

These attitudinal differences could have been anticipated from much of the previous discussion on the press of the socioeconomic environment and related determinants of academic motivation. Two studies, however, do not altogether verify results of this kind. Flanagan & Cooley (1966) obtained through their Project TALENT a wide array of attitudinal and particularly cognitive variables from a large national sample of high school students. In a one-year follow-up study they conducted a series of discriminant analyses to predict various post-high school educational groups: those who attended four-year colleges, nursing schools, junior colleges, business schools, and trade schools and those who did not attend college at all a year following their high school graduation.

For both men and women tested in the eleventh grade, information scales and especially such ability scales as mathematics and reading comprehension distinguished the follow-up groups more than all other sets of variables. Interest scales included Physical Science, Public Service, Literary-Linguistic Artistic, Sports, Business Management, and Mechanical-Technical Scales. The temperament scales were Sociability, Social Sensitivity, Impulsiveness, Vigor, Calmness, Tidiness, Culture, Leadership, Self-Confidence, and Mature Personality. The interest scales distinguished among the post-high school critierion groups for the men, but not the temperament scales. The temperament scales of Leadership, Sociability and especially Mature Personality did contribute to the two discriminant functions that distinguished the criterion groups for the women, but the interest scales generally received much greater weight on the two discriminant functions.

The temperament scales distinguished among groups of men attending different types of private, four-year colleges even though they did not among the post-high school criterion groups. But even in the analyses of men attending different types of private institutions, other variables had greater discriminating power. Perhaps they are also the result of the very low reliability, lack of independence, and absence of validation of the scales (see Flanagan, et al, 1964).

Two additional personality traits involved in decisions about college concern goal-directedness and personal adjustment. Baird (1967a) investigated a large sample of college-bound youths who were tested by the American College Testing Program (ACT) in 1964 and 1965, and found that they gave greatest importance first to vocational training (51%) and second, to the development of intellectual abilities (34%). Vocational training might be considered to have been of prime importance to 58% of the students when including the 7% who foremost desired a higher income. A small percentage of students chose as their most important goal to become a cultured person, enjoy life, develop their personality, develop a satisfying philosophy, to make a desirable marriage, or to develop moral standards.

The vocationally-oriented students had about an average level of academic aptitude measured by ACT, and came from families with slightly lower incomes than most of the groups. Their nonacademic achievements were average. They were practically-oriented in curricular and vocational choice, and were most likely to have decided upon a major. They also frequently planned on some postgraduate education. The students that emphasized higher income frequently came from low-income and rural backgrounds. They had the lowest grades in school and were low on the ACT and in nonacademic achievement. They were most likely to be undecided about their field but were practically-oriented in what choices they made. Few of them planned on postgraduate education.

The third of the sample that had as a primary goal the developing of their minds had high grades in school and high academic aptitude scores. They showed leadership abilities more than others, were influenced by the quality and reputation of their schools, and chose many vocations but centered on science majors and research more frequently than any other groups. They commonly planned on some postgraduate education. These findings add corroboration to the theories and research findings obtained from the studies reviewed herein.

Although most college students' occupational decisions seemed to be determined without conscious choice, those who were most concerned about preparation for a career were the most practical both as freshman and as seniors. A student typology revealed students to be within three classes according to their orientation to college and the curriculum: grades, career preparation or intellectual interest. For all freshman groups, Social Maturity scores were highest for the students who were intellectually-oriented. The grade-oriented college students showed the least tolerance for ambiguity, were the most rigid, cynical, pessimistic, immature and tied to their parents (Katz, et al. 1968). Thus, underlying the motivation to attend college may be quite different needs which are met in quite different ways by individuals with quite different backgrounds and characteristics.

Achievement motivation, including the motivation to attend college, may also include the disposition to withstand certain types of anxiety. As previously mentioned, positive self-concept is highly correlated with achievement in high school. Certainly, an individual must experience a certain level of self-esteem and self-confidence before he can take the kind of risks and withstand the consequent anxiety involved in college academic work. Trent & Medsker (1965) noted a tendency for the college-bound students in their original cross-country sample, to manifest less anxiety than their non-college peers. This notion further suggests the complexity of the personality. There are many aspects of the personality, and no doubt the interaction of personality traits, as well as the interaction of the various background characteristics, influences the specific decision to attend college, together with the young person's intellectual, personal and vocational development. More research is needed to sort out and differentially weight the factors involved in these complex interactions.

Chapter 9.

GROWTH AND DEVELOPMENT DURING COLLEGE

Up to this point in the discussion, the focus has been upon the pre-college development of youth and the factors involved in the decision to to go college. We are, of course, also concerned with what happens to youth after they enter college, how they change, and in what ways they change.

The evidence indicates that students change in a variety of ways during college. They not only exhibit increases in the amount of information they possess, skills in performing certain tasks, changes in interests and attitudes, but also, in many cases students undergo fundamental personality changes. In fact, according to Katz and associates (1968), students come to college for precisely these reasons--to learn skills, because it is "the thing to do," and to define their identities.

The major problem encountered in research on college students is the lack of comparable control groups of non-college subjects which makes it impossible to pinpoint changes during college as due entirely to the college experience rather than to other environmental or maturational influences. Trent and Medsker's (1968) study which followed high school students who entered college and those who did not is perhaps the most significant in this context. Although the students were not randomly assigned to college or non-college groups, given the exigencies of the real world of scientific investigation, their study is a best approximation of a controlled study and their data good indicators of the dimensions of growth brought about by the college experience. Moreover, the findings of the Trent and Medsker study are supported by the several other major longitudinal projects.

The evidence from Trent and Medsker's study clearly indicates that personality development and growth in autonomy (independence, nonstereotypy and openness of thinking) were most evident for college students, particularly for those who persisted for four years.

For example, college males' mean scores on one measure of autonomy (the nonauthoritarian scale) increased by 6 standard points (between the senior year in high school and four years later) whereas their employed male peers showed a decrease of 1 standard point. College students' mean score on a second measure of autonomy (the Social Maturity scale) increased by nearly 10 standard points whereas employed high school graduates' scores increased only 3.5 standard points.

The interpretations of several studies of personality change during college has been that the college experience has been a liberalizing one in terms of personality development (Dellas and Gaier, 1969; Dressel and Lehmann, 1965; Feldman and Newcomb, 1969; Freedman, 1960; Lehmann and Dressel, 1963; Lehmann, Sinka and Hartnett, 1966; Plant, 1965; Plant and Minium, 1967; Telford and Plant, 1963; Trent and Medsker, 1968; Webster, Freedman and Heist, 1962). These studies noted changes in students' attitudes at intervals of one to four years, compared changes of those students remaining for a full four years with changes in individuals withdrawing after various periods of time and compared changes of students who attended colleges for varying lengths of time with those of peers who did not enter college. The studies were based on a combination of objective evidence obtained from a number of cognitive and affective instruments and tests of critical thinking: the Omnibus Personality Inventory and a number of questionnaires developed specifically in relation to student experiences, current student language, and interviews from both students and faculty.

Major findings from these studies reveal that:

1. College students generally became significantly less stereotypic in their beliefs, less dogmatic, less authoritarian, and more receptive to new ideas.

2. Students who persisted in college for four years changed significantly more in measurable traits of autonomy and intellectual disposition after four years than students who withdrew from college before obtaining a baccalaureate degree. Both groups of college students changed significantly more on these traits than high school graduate peers who did not enter college, the latter tending to regress on these traits over a period of four years.

In general, however, persisters tended to be more intellectual, self-reliant and open-minded before entering college and even more intellectually-oriented and autonomous after four years compared to their peers who withdrew from college and particularly those who did not attend college. In addition, persisters, compared to withdrawals or non-attenders, showed significantly greater aesthetic appreciation, greater positive change in autonomy, a greater tendency towards reflective thought, tolerance for ambiguity, intellectual orientation, interest in cultural activities (e.g., preference for classical music) and were less religious in orientation.

3. Students showed significant improvement in critical thinking ability. There were significant differences in critical thinking, values and attitudes between persisters and withdrawals and between freshman, sophomores, juniors and seniors. Both males and females scored higher on tests of critical thinking as seniors than as freshman and lower on traditional values and dogmatism.

4. There is some evidence that the greatest amount of change in students' values and attitudes took place during their first two years of college, although they continued to change significantly during their third and fourth years of college. For example, the major changes in critical thinking appeared to occur in the freshman year--students who completed the freshman year also had significantly higher scores on tests of reading ability and academic aptitude than those who withdrew. There were less, but some, positive changes at the end of the sophomore and senior years but no gains were noted for juniors.

5. College seniors were found to be significantly less authoritarian than they had been as freshmen. Those students who remained in college over a two-year period became significantly less ethnocentric in attitude compared to those who withdrew.

6. There is some but not entirely consistent evidence that college males and females changed in different ways and that college women changed more than men on certain personality traits regardless of the amount of time spent in college. For example, males were significantly more stereotypic and dogmatic than females, scored higher on the theoretical, political and economic scales of the Study of Values, and were oriented more toward emergent values. Females scored significantly higher on the Aesthetic, Social and Religious scales and were more traditional value-oriented. On measurements having to do with liberal versus conservative issues, men generally became more liberal than women.

7. Students generally changed toward the peer norm, so that seniors were more alike in attitudes and values than freshmen, the norm usually being in a more liberal direction. Newcomb's (1943) study of Bennington College students represented the first systematic attempt to relate

expressed political attitude change to both the initial values of students and to the social and academic values of the college as a community. Although the students as a group became less conservative during college, the political attitudes developed in college, whether liberal or conservative, persisted after college.

Persistence of attitude was a function of environmental support, that is, women whose post-college environment was supportive of (or congruent with) their political attitudes developed in college showed higher persistence of attitude than women whose post-college environment was incongruent with their college attitude. Persistence of political attitude after college was also a function of personal orientation toward the collegiate community norms. That is, among conservative women those who were aware of their incongruence with the prevailing community norms and who were not negativistic or opposed to these norms, were most likely to change toward liberal attitudes after college. Those who were unaware and negativisitic were least likely to change.

Newcomb also found a relationship between political attitudes and personality. For example, authoritarianism was significantly correlated with conservativism in political attitudes. However, females who were negativistic (opposed to) their community norms but were aware of their negativism, changed in a more liberal direction in contrast to females who were negativistic but unaware of their negativism.

The relationship found between attitudes and personality traits supports the hypothesis raised in the previous section concerning the interrelationship between students' educational and vocational attitudes and their personality characteristics. More research is clearly needed, however, to determine the nature and extent of these relationships.

8. While in college, students developed a greater sense of social responsibility, confidence in personal relationships, and a clearer sense of identity.

Two of the most important aspects of personality development, according to Erikson (1951)are identity, the determination of who and what one is and value in respect to self and others, and identity crisis, confrontation with significant others and events leading to a testing of the individual's independent identity. Identity crisis frequently begins in reference to parents. According to Katz and associates, the differentiation of self from parents seemed to be manifest in the realization that many students really didn't want to do what they always thought they would do or what their parents expected of them. Although these identity crises were not as dramatic as expected and were usually not resolved by college graduation, the struggles of extraction from the "child-self" and/or parents' aspirations caused depression and sadness in college students which were perceived by the researchers as positive signs of growth. One form of this identity shock was called "background shock" and referred to students' realization that for the first time they were not first in academic, social or athletic competition and that they had serious background deficiencies compared to other students. Unfortunately, however, students tended to dichotomize their pasts as reminiscences and their present in terms of reasoning independent of their past experiences, so that they failed to recognize the importance of their histories in determining their present attitudes and behavior.

Of course, there is no way of determining from these data the nature of the identity crisis, if any, of those who do not go to college. It may be that young people who do not go to college do not define their identities until much later in life. It is also possible that they do define their identities at approximately the same time but in different ways.

Without continued research on both college and non-college populations through the early and middle adult years, we cannot determine the effects of college education compared to alternative non-school experiences on the growth and development of individual people.

9. Although a sizeable number of students did not feel that any major changes had occurred in their attitudes, values or interests, at least one-third of the males and one-half of the females reported significant changes in their personality after entering college and over three-fourths of both persisters and withdrawals believed that college had had a liberalizing effect on their views. More than one-third of the seniors felt that they had become more stable than they had as freshmen, had more self-understanding, self-criticism, self-satisfaction, more emotional control, ability to face limitations, a better defined philosophy and set of interests. In addition, 42% of the seniors said that it was easier to "feel close" to people as seniors than as freshmen.

Both persisters and withdrawals reported that they had become more flexible, less authoritarian, more tolerant of ambiguity and complexity, more open-minded and understanding about others, changed their ideas about behavior standards with a widespread lessening of moralistic outlook, were more able to define their life goals, became more assured of their ability to handle new problems, started to question moral and religious absolutes and became more interested in world events.

There were, however, significant differences between persisters and withdrawals at different time periods and between the sexes in degree of self-perceived change. In all of the following areas, the more college attended, the greater the increase in: tolerance of people of different races or beliefs; insight into others; interest in social, intellectual and cultural affairs (e.g., the more college a subject had, the greater the existence in his "ideal" community of a good bookstore and a theater showing foreign and art films); critical reasoning (for males only); responsibility for behavior; and pessimism regarding the future of civilization.

Similarly, as subjects completed more college there was a progressive decrease in acceptance and adherence to religious beliefs and respect for rules. More seniors than freshmen felt it was important to acquire a liberal education rather than a vocational education and placed greater stress on the importance of general education geared toward the appreciation of knowledge. Compared to employed youth, more college persisters reported having browsed in bookstores, attending theaters, concerts, liking classical music and being interested in intellectual rather than "practical" professions.

Positive relationships were also found between amount of college attended and planned participation in community activities. Students with more college tended to plan on taking part in more country clubs and in cultural functions. Persistence in school was also related to liberal political attitudes; women whose attitudes deviated from liberal community norms had a higher attrition rate than those whose attitudes were congruent. In contrast, several investigators found that less than one-third of the males and one-half of the females in the sample reported much change in their political views after entering college. It may be, however, that more of the students in these samples were liberal to begin with.

10. Not all changes were in a positive direction. A small but significant proportion of students regressed on measurable personality traits, becoming more authoritarian and close-minded rather than autonomous and

intellectually disposed. A small percentage of both persisters and withdrawals also reported that they had changed in the direction of becoming less tolerant, less receptive to new ideas, and less responsive towards the views of others.

In addition, rankings of personal interests and activities changed strikingly little from freshman to senior years--career, family, love and affection, and developing a personal identity were consistently seen as the most important factors of life.

11. There were no significant differences between amount of college attended and certainty of future plans, although proportionately fewer seniors had definite plans than freshman withdrawals. Overall, over 50% of the senior males and over 40% of the senior females were uncertain of what they would be doing in the immediate future. Nevertheless, the more exposure a student had to college, the more likely he was to express aspirations to do post-graduate work; the greatest increase in desire to attend graduate school, particularly for women, occurred during the last two years of undergraduate school.

12. "Student input" variables such as academic aptitude and socio-economic status were found to interact with students' changes in personality dimensions. Students of high academic aptitude changed more than those of lower aptitude. However, measurable change continued to exist independent of these input variables. In fact, as mentioned previously, the academic aptitude scores of a considerable majority of persisters and withdrawals overlapped and only a minority of withdrawals reported leaving college for academic reasons.

13. Some indications were that changes in students' attitudes and values varied by the type of institution attended. For example, social maturity, intellectual disposition and autonomy were found to be lowest

among two-year college students compared to students attending four-year colleges and universities, and the greatest positive changes in autonomy over four years occurred among public college students; the least change was among Protestant fundamentalists and Catholic college students followed by other Protestants. There were no significant differences, however, in the degree of change in intellectual disposition and autonomy among students attending different types of colleges.

On the basis of a very select and small sample, there were only slight differences in critical thinking, values and attitudes among students attending two small midwestern colleges and those attending a large university. Students at the large university did have significantly higher critical thinking scores than students at small church-related colleges. When critical thinking was controlled, however, the only significant difference was the stereotypy scores for males. There was a significant difference between the three schools on the test of religious beliefs, but for women only.

14. Changes in students' values and attitudes varied by major field of study both within and among colleges. At college entry, students' critical thinking ability, values and attitudes differed according to major field of study. Females in non-technical curricula such as social science, humanities and commercial arts were less stereotypic and less dogmatic than females in vocationally-oriented curricula. There were, however, more marked differences between males in different curricula than between females. Those scoring high in the cognitive area tended to exhibit less stereotypic beliefs, less dogmatism and be less oriented toward traditional values. There were some significant differences between males who remained in their majors and those who changed majors. Those students who changed majors and had a low grade-point average were the

most dogmatic and stereotypic. The non-changers, however, had the highest mean traditional-value scores. For females, there were no significant differences in stereotypy or dogmatism between changers and non-changers. Female changers with low grade-point averages had the highest traditional-value scores.

15. Tentative evidence suggests that faculty had influence on individual students' career decisions but had relatively little impact on students' changes in values and attitudes generally. This is understandable in light of the fact that in many colleges, students and faculty spend relatively little time with each other, particularly in informal situations. Thus, according to Jencks and Riesman (1965):

> Unless the academic relations of classroom and office are extended to the social and personal relations of dining room and living room, we doubt that the faculty can play an important role in shaping the community which educates the students (p. 764).

On the other hand, motivation to seek advanced education was strengthened by good teachers in the students' major fields and particularly major field professors who gave positive evaluations of students' ability. Motivation was weakened by teachers who required rigid adherence to course and curricular requirements and teachers who emphasized the vocational aspects of education. Moreover, both college persisters and withdrawals were consistent in their evaluations of the qualities of a good teacher--one who makes the student produce, know the subject-matter, teaches in an interesting and entertaining manner and grades objectively. Over two-thirds of both persisters and withdrawals, males and females, described their teachers as enthusiastic.

As subjects completed more college, they were more likely to cite academic experiences such as classes and teachers in the major field as having an impact upon them. University females indicated that they were influenced by non-academic experiences more than did males, such experiences being friends, dating, and living away from home. First and second year withdrawals in this study, on the other hand, frequently indicated that non-academic aspects of college life such as friends, "bull sessions," and merely living away from home, had more effect upon them than academic experiences. In addition, male university withdrawals cited general education courses as having a greater impact on their attitudes and behavior than did seniors who stressed major field experiences.

When freshmen who changed majors were analyzed, females reported a course or courses and certain cultural activities that had influenced the perceived changes in their values and attitudes. Those who were traditional-value oriented felt that courses had an impact on their behavior and attitudes. For males, those who became less stereotypic reported that rules and regulations had an impact on their behavior and attitudes. In the sophomore year, females mentioned courses and males mentioned the need to conform. For the junior and senior years, the experiences related to positive changes were: close friends and dating, being away from home, sorority or fraternity membership and family.

Although most of the university students indicated that instructors and courses affected their attitudes, values and beliefs, more than peers, all groups believed that their peers exerted a greater influence.

As mentioned earlier in the section on College Environments, the motivation to seek advanced education was strengthened by an upper-class environment with a strong press from peers for intellectualism and peers' plans to do advanced work. In general, the students' career choice tended to move into closer conformity with the more popular career choices among fellow students. This was particularly evident in the fields of engineering, business and business law. College environments where there was considerable religious activity and little drinking tended to shift students away from careers in the arts and social sciences and into careers such as the clergy, medicine, and teaching. However, when the college environment was viewed independently of its student body, its effect on the individual students' career plans appeared to be trivial.

Although these studies have demonstrated that significant changes occur in the attitudes, values, interests, and beliefs of college students between the freshman and senior years, questions remain regarding the amount college actually contributes to these changes and what specific college aspects are related to students' changing. Plant (1965) concluded that the reported changes in personality characteristics resulting from college attendance may well represent developmental changes for bright young adults irrespective of their higher educational attainment during a given period of time. Trent and Medsker (1968) concluded that college might only be acting as a facilitating agency, providing the opportunities for change and growth for these students already predisposed to change. Likewise, Lehmann, Sinka and Hartnett (1966) suggested that college education, per se, is not instrumental in bringing about personality changes, although attendance might facilitate this development. Feldman and Newcomb (1969) discuss college impacts in terms of accentuation. That is, the characteristics which impel a person towards a particular educational setting are the characteristics which are reinforced and strengthened by that setting. Therefore, college faculties and administrators must realize that they are not necessarily providing a unique experience for their students, but that predisposition, maturation, and the social environment might have more impact on personality development than courses and formal academic experiences.

Clearly, the impact of college is not simple or clear-cut. More complex studies are needed. There has been little evidence that any one factor explains changes in attitudes and values. Moreover, there have been few studies in which alumni have been compared with seniors in terms of achievement test scores or other achievement criteria. And, although most research indicates that college students change in some areas, very little is known about how or why. Not all seniors differ from freshman. It may be that for some students, strong dependent relationships with parents throughout the college years prevent attitude and value changes. On the other hand, it may be that the authoritarian conscience of some freshmen find reinforcement in campus authority figures and thus the lack of change between the freshman and senior years. Clearly, an explanation must be found for those that do not go along with the majority. Moreover, three studies observed significant negative changes among sizeable groups of students (Katz, et al., 1968; Lehmann and Dressel, 1963; Trent and Medsker, 1968). No doubt this phenomenon exists on a much wider basis than indicated by most longitudinal research to date, and certainly warrants much more definitive investigation.

More research is also needed to determine the relationships between socioeconomic status, aptitude, personality dimensions, and other student background characteristics and success or failure at colleges that have identificable sub-cultural patterns and institutional differences. Significant subgroups within each institution must be explored and measured. Most of the longitudinal research to date has considered college students as a group. Little information has been gleaned concerning important subgroups of the college population. Moreover, particular relationships among institutional characteristics, student characteristics and student change must be explored. More attention must be given to appropriate multivariate statistics simultaneously taking into account student input characteristics, educational experiences, environmental factors and carefully delineated outcomes. Such analyses need also to be made in comparison with non-college control groups. Much more attention needs to be given to the independent effects of the total college experience. Intellectual and personal growth are inner processes which feed upon emotional, social and physical factors in the environment. Whatever the individual propensity or the environmental press, the interaction of personality factors with external demands must be observed in any concern with student development.

Chapter 10.

SUMMARY, IMPLICATIONS AND RECOMMENDATIONS

It is not a contradiction in terms to state that based upon the synthesis of research findings from the many studies examined in this report, we know a great deal about students and at the same time we know so very little about their growth and development. The findings have provided information concerning the classes of variables described in the General Educational Development Model (pictured on page 20) which are particularly relevant to students' growth and development. Moreover, many of the assumptions posited by this theoretical model have been empirically supported. The findings, however, for the most part did not provide sufficient information concerning the linkages among the elements or classes of variables, although this information is vital to an understanding of the complex interrelationships and interactions of these variables as they contribute to students' growth. For instance, numerous factors of the early socioeconomic environment have been delineated which have a positive and negative effect on youths' development, but these effects have not been examined systematically throughout the school years among the same individuals.

To amplify, there are strong indications that the development of traits leading to achievement in school begins long before the first grade. This development is rooted in and highly affected by the complex of family and surrounding variables that constitute the socioeconomic environment , although it is generally little affected by school experiences after matriculation. Yet, certain school experiences can have an effect on the development of students. This is particularly true if the programs providing these experiences are designed with the students' characteristics in mind from the start, and if they are maintained throughout a number of grade levels rather than merely for a single term or year. But we still do not know the precise ways in which students' background characteristics, socioeconomic status, sex, and race are separately and together mediated by, or can be mediated and modified by the school system.

We know that by the end of high school, students have established patterns of performance and growth that appear to channel them into various life roles and life styles after high school even without great self-awareness on their part of the alternatives, or awareness of their interests, needs, or their environment. We do not know, however, to what extent these patterns are amenable to change or modification, or exactly how to go about promoting positive change and arresting negative change which is also in evidence. Perhaps equally important, we know almost nothing about the time and circumstances of critical decision-points which have a crucial bearing on the individual's personal, educational, and career development.

The proliferating base of studies and data has yet to derive a mature theoretical foundation for a general developmental theory of growth. Inadequate controls for self-selection into and out of the educational system has prevented confident judgments as to the general impacts of education on student development. The lack of attention devoted to the effects of many different kinds of interactions such as the interactions of student-teacher, student-instructional method, student-institution, and the more complex interactions of personality-aptitude-motivation-achievement, student-family-school and student-family-community-school, in the studies reviewed is disappointing. The lack of such critical information seriously impedes intelligent discussion of the implications of the research findings for educational policy. For example, several studies measured both institutional and student background characteristics, but pursued analyses which sought the impacts of school factors independent of student backgrounds employing student characteristics as controls. Assuming the significance of educational impacts reported in these studies, explanations of what kinds of institutional characteristics, teacher characteristics, or programs are responsible for what kinds of development and how such influences are manifest remains obscure.

This situation is further confounded in many cases by the lack of precise definitions of the variables underinvestigation and direct measures of both the dependent and independent variables. For example, teaching ability was not operationally defined in any of the studies reviewed and, at the same time only indirect measures of "teaching ability" were used, such as students' achievement on standardized tests correlated with teachers' salary, verbal ability, and experiences. The impact of teachers on students' non-cognitive outcomes was not really measured at all. Assuming that the ability of teachers to teach influences at least some of what students learn, more direct measures of such ability must be employed with respect to both non-cognitive and cognitive outcomes.

In addition, a great deal of evidence suggests the hypothesis that different kinds of students (both in terms of aptitude and personality) learn better with certain kinds of teachers employing certain kinds of instructional methods. According to Popham (1968), "particular teachers do best with particular students using particular kinds of instructional methods." Thus we must determine what kinds of students are best suited for what kinds of teachers using what kinds of instructional methods in order to effectively determine the kinds of growth and development schools can facilitate. Unfortunately, specification of what kinds of students in what kinds of school environments exhibit what kinds of outcomes was within reach to some extent in the studies reviewed but left relatively unreported and, we assume, unanalyzed. More experimentally controlled research is needed which employs better and more direct measures of classroom transaction and, again, broad, long-range indicators of both students' cognitive and non-cognitive outcomes.

Hypotheses about the significance of non-cognitive growth for human adaptation and creativity have remained incompletely explored. While non-cognitive development has become a favorite topic for research, and despite the critical importance of non-cognitive outcomes, little research has been directed to discovering its determinants. Moreover, a wide array of non-cognitive variables have been investigated in isolation, with minimal success in establishing patterns or organization of values attitudes, and personality characteristics that develop in concert.

Do certain values, attitudes, and personalities reflect maturity in our modern world? If so, how do complex diversities in social, educational, economic, vocational and political life affect the requirements of maturity and the components of satisfaction and happiness? How can the educational system as a whole contribute to the development and enhancement of young people's maturity, success, and happiness throughout life?

The development of cognitive skills are, of course, critical to students' educational progress. Also critical are such traits as self-awareness, awareness of the larger environment, a sense of self-esteem, a sense of self-competency and personal autonomy. These traits can be discerned in the early years of a child's life and are predictive of later adolescent and adult behavior. These traits can also be modified, however, if facilitated by the faculty and general educational settings. Such facilitation is not automatic. A good deal more research and more sophisticated research will be required before it can be implemented adequately and in a pervasive manner.

Clearly the decision to progress through high school and to enter college is the cumulative result of the influence of a large number of interacting variables over an extended period of time. Even for the college-bound--those who have already decided to attend college--the choice of a particular college is influenced by such complex factors as its intellectual emphasis, practicality, and social emphasis as well as the advice of others (Richards and Holland, 1965). The process of deciding upon college, though much influenced by socioeconomic press, is seldom primarily a matter of financial status. Influencing elements are frequently psychological, and often irrational as well (Dinklage, 1966; Kurland, 1967). Thus, according to Trent (1970) the decision to progress through school and to go to college involves a multivariate process of decision-making. The understanding of this process also involves the refinement and elaboration of the type of multivariate analyses undertaken in this study. The analyses needed are discussed in detail in Volume III of the Analytical Review.

In the meantime most of Trent's conclusions as the result of his earlier review are equally relevant in the present context. In sum:

1. Vocational development in terms of career aspirations and attainments and educational development in terms of advancement through school, the decision to enter college and persistence in college are part of enduring processes. They are the result of an accumulative, interrelated and interacting multivariate process that begins during earliest childhood.
2. Socioeconomic status is a complex environmental press on both vocational and educational development. Financial conditions are but one aspect of socioeconomic status. Although centered in the family, socioeconomic status includes peers, specific locale, school and community.
3. Motivation primes the established behavior underlying student development defined primarily in terms of vocational, educational and social development.

4. Parental influence is predominant in student development.
5. Peer groups, and such subcultural elements as religious background and minority status also represent important environmental presses on student development.
6. Schools, although capable of exerting a positive influence on student development are generally neutral and sometimes negative in influence.
7. Community characteristics are associated with student development.
8. The components of student development--vocational, educational, personal and social development--are interdependent.
9. The dynamics of student development are diverse, varying by the individual student and by groups of students categorized by different characteristics.
10. The interaction and relative weight of variables that contribute to student development on an individual or group basis are identifiable and can be used to assist students toward the realization of their potential and satisfaction on both a "diagnostic" and "therapeutic" basis. Practical programs for this purpose, however, will require more comprehensive evaluative research on student development than exists to date.

As indicated by the matrices in the appendix to this volume, data are available which pertain to most of the "cells" shown in Figures 1 through 3. Although the data lack comprehensiveness in a number of the cells, there is very little divergence among them. They do not, and could not really be expected to demonstrate the student development model depicted in Figure 3, discussed in more detail in Volume I of the Analytical Review. They do, however, indicate the viability and relevance of the model. They also suggest the artificiality of the original intent of the present project to develop four separate models: educational flow; personal and social development; intellectual development; and vocational development. The General Educational Development Model appropriately merges the four areas of development since they are so intricately related.

But, as indicated, problems remain. The difficulty is not divergence of information but rather missing data and lack of precision of existing data. The evidence is that human development from birth through the educational system proceeds along the sequential line of influential experiences and conditions suggested in Figure 3, from the base to the apex of the figure. Yet, relatively little is known about the effects of such elements as cultural standards, educational screening, programs and characteristics, and the whole related areas of employment and vocational development. Also little is known about the precise nature and "weights" of the interrelationships and interactions of the elements depicted in Figure 3 in reference to the development of the individual. Still less is known about the points of key decisions and growth of the individual in this process.

Some of these difficulties are all the more evident upon considering a simulation of the educational process and its effects, drawing upon data such as those under review.

Eventually, the data contained in the Analytical Review and related projects might well be used in an attempt to simulate the educational process. With such a simulation model, ideally it would be possible to determine the effects of numerous alternative policies and procedures without necessarily tampering with the nature of the educational system itself, since simulation affords some assurance that contemplated changes will have beneficial outcomes prior to upsetting the existing educational system. In this sense, simulation provides a laboratory for the study of educational policy and practice (Buffa, 1968).

In general, simulation is useful in those situations when detailed mathematical analysis is either too complex or too costly. If a particular educational problem can be well represented by a specific mathematical model, then that approach is often more desirable. But in those situations where the problem is extremely complex because of a mammoth maze of interacting variables, or where the problem is relatively simple in structure but requires mathematical equations of unknown areas, simulation can provide the optimum alternative for analysis of the problem. A simulation model is constructed so that it represents the essential features of the system under study; by feeding input data into the model, it is then possible to study the nature of educational change in terms of input versus output measurements.

Unfortunately, however, no matter how simulation avoids the problem of unknown equations, it still demands rather accurate input data. In this regard, simulation is an exacting and precise science. Yet, educational knowledge, at present, is neither exact nor precise.

Essentially, there are four conditions prevalent in current research that make it difficult to simulate the educational process. Each involves the nature of the relationships between the independent variables involved and their dependent correlates. Briefly, the four cases are:

1. Where there are legitimate questions whether a relationship between the specified variables exists at all.
2. Where there is evidence that two variables are related; but there is little, no, or conflicting evidence as to the direction of that relationship (i.e., whether a certain input has a positive or negative impact on a desired output).
3. Where there is evidence of both the existence and direction of a relationship between two variables, but where its specific magnitude is unknown.
4. Where there is reason to believe that one of the variables involved is so imprecisely defined that it prohibits reliable findings (i.e., where different studies have found relationships of the same direction and magnitude involving a variable which is too broadly defined to be simulated effectively.

The various Analytical Review studies are replete with examples from all four of these situations, particularly the third and fourth. The first case (inconclusive evidence as to a relationship's existence) is illustrated by Thisthlethwaite's hypothesis that students' level of contact with faculty members in their major fields will have a positive influence on their decision to go to graduate school. This seemed a reasonable suggestion because a relatively large percentage of those students who attend graduate school do so in the same fields as their undergraduate majors, but it is not confirmed by the data.

The second case, although less frequent than the first, is still surprisingly commonplace among the Analytical Review studies. So many different researchers have looked at essentially overlapping questions that the problem may be unavoidable. There are numerous situations where the direction of a specific relationship is not definitive; this often develops when there are seemingly conclusive but conflicting results but it can also result from the lack of testing for spuriousness or rival interpretations of the data, a process described more fully in Chapter III, Volume IV.

For example, Kagan and Moss found a high correlation between the desire for social recognition and achievement behavior for both men and women. It is not clear, however, whether successful achievement behavior or goal attainment results in the desire for social recognition or was caused by the desire for social recognition.

The third situation, where only the magnitude of a relationship is in question, is by far the most frequent difficulty encountered in building a simulation model. Inevitably, when a number of studies are concerned with the same relationship, the numerical results are likely to differ. But an efficient simulation requires that somehow all quantifications of the relationship between Variables X and Y be collapsed into a more useful format than has existed previously. For example, suppose five studies have indicated that a positive input variable X results in a positive output variable Y, but each of the studies yield different mathematical relationships. The five equations could be combined by means of a simple average, but this procedure precludes the fact that the studies are probably not equal in reliability. For example, some studies may have used larger samples; some may have used better statistical techniques; the reputation for accuracy of some researchers may demand more confidence than that of others. We are left, quite simply, then, without a definitive method for combining the seemingly congruent results of various projects. A representative sample of this difficulty is suggested by the relationship of favorable childhood psychological experiences and eventual entrance into college. There is substantial evidence that such a relationship exists, and that it exercises a positive influence. But the specific nature and quantity of the correlation is, as of now, essentially unspecified.

The fourth difficulty, inadequate definition of a variable, presents what is perhaps the most acute simulation problem. Over the course of the last several decades, educational researchers seem to have developed a special language of vague variables, many of which are consistently used in longitudinal projects, including those under review. Such items as "creativity", "intellectual disposition", "socioeconomic status", and "autonomy", except when specifically defined in terms of a particular measurement, are often concepts more than they are operationally defined research variables. And even when they are defined, it is usually true that different projects, while including variables called by the same name, commonly use diverse indicators for the same concept.

This phenomenon is especially true in regard to such concepts as "socioeconomic status" (SES). An examination of thirteen of the Analytical Review studies reveals thirteen separate definitions as to what variables indicate such status.* As indicated in Figure 4, some studies use only one indicator, while others use as many as eight different inputs. And sometimes the multiple indicators are treated as independent items, other times they are combined into a scale score. Although most projects use the father's occupational status and educational background as measures of socioeconomic status, no less than 17 other items are used with varying frequency, among them, the number of books in the home, the number of rooms (or bathrooms) in the home, size and/or intactness of the family unit, whether parents speak a language other than English, parents' income, quality of the home neighborhood, and the respondents' religion.

Often, when comparing socioeconomic status to other variables, the studies treat all these measures as if they were identical, even though they are not. Although some researchers have suggested that father's occupation is the "best" of all socioeconomic status scales, such a simplification involves two problems:

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*Astin and Panos; Bachman; Coleman; Flanagan, et al, Hilton; Husen; Jones, et al; Kagan and Moss; Lehmann and Dressel; Thistlethwaite; Tillery, et al; and Trent and Medsker.

	VARIABLE LIST																		
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s
ASTIN	x		x	x		x													
ASTIN AND PANOS	x		x																
BACHMAN	x		x	x	x	x	x					x							
COLEMAN	x		x	x	x							x			x				
HILTON	x	x	x	x					x										
HUSEN	x		x	x															
JONES			x	x							x		x	x		x	x	x	
KAGAN AND MOSS			x	x															
LEHMANN AND DRESSEL	x		x	x										x					x
SCOPE	x																		
TALENT	x		x	x		x		x		x							x		
THISTLETHWAITE			x	x													x		
TRENT AND MEDSKER	x																		

Variable list key:
a. father's occupation
b. mother's occupation
c. father's educational level
d. mother's educational level
e. "possessions" in the home
f. number of books in the home
g. rooms per person in the home
h. appliances in the home
i. number of bathrooms in the home
j. student has own room and desk
k. size of family
l. intactness of family
m. ethnic and cultural background
n. native American citizenship
o. language other than English spoken in home
p. age of parents
q. parents' income
r. quality of home neighborhood
s. religious background

Figure 4. Variation in the Indicators of Socioeconomic Status Used in the Analytical Review Studies

1. The first concerns the weighting of the different indicators. For example the original socioeconomic status scales developed by W. Lloyd Warner (1960) weighed Occupation most heavily in determining social class, but since occupation was the primary determinant, it is not surprising that it is the primary correlate of socioeconomic status.
2. The suggestion that anything is a "best" indicator of socioeconomic status necessarily implies that socioeconomic status is an independently functioning variable which can be estimated through the use of various items. But there are some questions as to whether such concept variables exist at all in reality, or if they are actually independent of their own indicators.

Of the studies included in the Analytical Review, Bachman's (1970) study seems most cognizant of the question of socioeconomic status and goes farthest toward providing the information necessary to use the related data. He notes:

> There is no broad agreement about just what is meant by the terms socioeconomic status and socioeconomic level. We have...examined the dimensions which, weighted equally, provide the composite measure of socioeconomic level used in the present study. In summary, the measure consists of one "part" father's occupational status, two "parts" parents' education, and three "parts" having to do with family possessions (Vol. 2, p. 14).

Unfortunately, Bachman admits that he has chosen variables for inclusion not on the basis of independent judgments, but rather on how well each variable predicts certain validating criteria to which socioeconomic status ought to be related. The author states that:

> There is a degree of circularity in using a number of measures as validating criteria for developing a measure of socioeconomic level, and then using the same data to consider the effects of socioeconomic level (Vol. 2, p. 230).

Whatever the errors in logical reasoning, at least Bachman, unlike many others, has included data necessary to deal with his index in a meaningful way.

Recognizing that all these problems now make educational simulation a difficult endeavor, it is nonetheless important to attempt such modeling on a limited scale. Such an activity serves three purposes--it suggests what kinds of information are needed, it highlights current problems inherent in the process, and it demonstrates the kinds of analyses that are needed before a complete simulation can be constructed.

Assume our interests are limited to a rather specific problem, predicting whether or not a given student is likely to enter college, and that all the information we have about each student is sex, aptitude score, and socioeconomic status (by quartiles). To simplify the mathematics entailed, assume that whenever the probability a student will enter college is greater than .50, he is likely to enter college.

Using the data matrix from Flanagan, et al. (1971) it is possible to establish a path analysis diagram of college attendance as indicated in Figure 5. Several things of note emerge from the diagram. Divided into 32 groupings, 15 (or 47%) of the students here represented are likely to attend college. (The outcome is slightly off--by 1%--and would have to be weighted to represent the unequal proportions of males and females who graduate from high school).

Since we are concerned with only 3 input variables, the number of output cases is 32. But it should be remembered that the number of outcomes varies geometrically with the number of variables and the number of gradations for each. Here we have only 32; but, for example, a study using 8 variables, even if each had but 2 gradations, would yield 256 outcome paths. Obviously, as the number of variables and/or variable score alternatives increase to the magnitude required by a sophisticated simulation model, the output matrix becomes gargantuan. There are, perhaps, at least a dozen variables one might wish to study; assuming that each only had 3 gradations (positive, negative or no impact, high, middle or low, etc.) no less than 312 intermediary or 531,441 outcome variables would result. To solve such a massive simulation, effective computer programming and efficient simplication of the matrix would be a necessity.

College attendance is, of course, but one of many sub-sets of criteria that would be included in a complete simulation of the educational process. Given present knowledge of related data it is one of the few criteria that can be effectively used. Before a complete simulation of the educational process could be constructed, however, it would be necessary to collect useable data on such factors as personal psychological characteristics, home and peer environments, high school performance, college persistence and performance, post-graduate education, and vocational choice. Of the studies included in the Analytical Review, Project TALENT

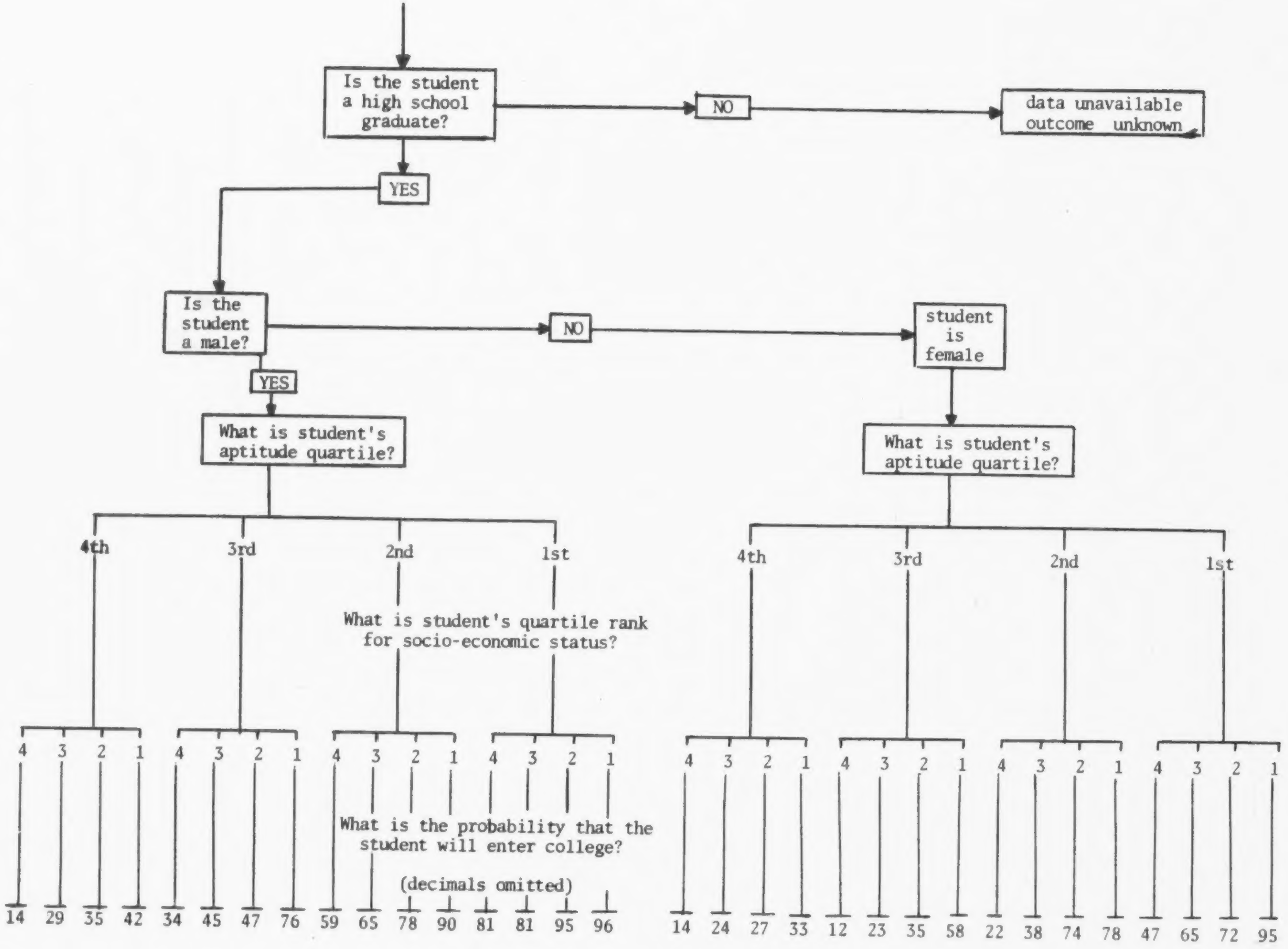
Is the student a high school graduate?
NO
data unavailable outcome unknown
YES
Is the student a male?
NO
student is female
YES
What is student's aptitude quartile?
What is student's aptitude quartile?
4th
3rd
2nd
1st
What is student's quartile rank for socio-economic status?
4th
3rd
2nd
1st
4
3
2
1
What is the probability that the student will enter college?
(decimals omitted)
14
29
35
42
34
45
47
76
59
65
78
90
81
81
95
96
14
24
27
33
12
23
35
58
22
38
74
78
47
65
72
95

Figure 5. Flow Chart Simulation of the Probability that a Given Student Will Enter College

Based on Project TALENT data; coefficients greater than 50 indicate prediction that a given student will go to college.

SUMMARY OF FIGURE 5.

PREDICTIONS OF STUDENTS LIKELY TO GO TO COLLEGE

Males in 1st or 2nd aptitude quartile, regardless of SES rating
Males in 3rd aptitude quartile and 1st SES quartile
Females in 1st aptitude quartile and 1st, 2nd or 3rd SES quartile
Females in 2nd aptitude quartile and 1st or 2nd SES quartile
Females in 3rd aptitude quartile and 1st SES quartile

PREDICTIONS OF STUDENTS NOT LIKELY TO GO TO COLLEGE

Males and females in 4th aptitude quartile, regardless of SES
Males in 3rd aptitude quartile and 2nd, 3rd or 4th SES quartile
Females in 1st aptitude quartile and 4th SES quartile
Females in 2nd aptitude quartile and 3rd or 4th SES quartile
Females in 3rd aptitude quartile and 2nd, 3rd or 4th SES quartile

Probability that a male will attend college = .568
Probability that a female will attend college = .405

Figure 5 (cont.)

seems to provide some of the most valuable data along these dimensions. But it is, by itself, still an insufficient base for definitive simulation. And the task of combining TALENT data with those included in other studies will be immensely difficult.

Within the limitations of current computer technology, such a simulation is possible. But it would be costly, requiring a great many man-years for completion. And, given the crude state of many educational data, it is unlikely that simulation would now produce answers proportional to its cost. As a tool for the future, educational simulation would seem to hold great potential. But its present use is questionable, if only because the input data are not yet sufficiently developed. But the problem is not just a matter of "input data." Myrdal's (1959) judgment some years ago is equally applicable to the present context:

> In our present situation the task is not, as is sometimes assumed, the relatively easy one of filling "empty boxes" of theory with a content of empirical knowledge about reality. For our theoretical boxes are empty primarily because they are not built in such a way that they can hold reality (p. 163).

To repeat a case in point, although we do not know what student outcomes would be if young people did not ever attend school, we do know that students who attend college do change in various ways and at varying rates more than their non-college peers. But we do not know if this change is a result of a predisposition to growth established early in childhood built upon the foundation of a solid socioeconomic status and comfortable conducive family environments, or the result of the college experience. Perhaps--to repeat a point raised earlier--as Lehmann and Dressel

(1963) and Trent and Medsker (1968) conclude, college only facilitates the growth of individuals who are already predisposed to change and growth. Yet, enough change among students has been found to vary by specific, measured educational environments to suggest that school characteristics could have a much more profound effect on student development than is apparent at present.

Only continued, more comprehensive research and empirical validation of the interaction of individual characteristics, predisposition to growth, and environmental press on growth, based upon appropriate theory, will provide the necessary information concerning the impact, if any, of schools and colleges upon students' development.

Again, Trent's (1970) conclusions concerning needed research as the result of his earlier review are equally applicable to the present situation: Optimum provision of education at all levels is dependent upon research and evaluation programs, including the following interrelated objectives:

(a) to learn more about who specifically can profit in what ways from how much of what kind of education; this can be accomplished at least in part by determining a broad range of measurable criteria of school effects beyond persistence and grade point or standardized test achievements;

(b) to improve the information base regarding the dynamics of educational-vocational decision-making and the refinement of models designed to apply this knowledge through the development of expedient measurements of the variables of concern including the cost-effectiveness of varying educational practices which will provide relatively economical comparative analyses across age and grade levels; in addition, to improve the information base through a determination of the optimum effects of alternative designs, sampling and statistical tehcniques in light of the research needs indicated in the present context;

(c) to learn how to restructure the socioeconomic environment beneficially when it is found debilitating to optimum educational-vocational decision-making;

(d) to evaluate programs designed to assist students in their educational achievements and decisions, to document the common elements of those programs found to be most effective, to determine replicable features of highly evaluated programs, to learn how to apply them economically on a wide scale;

(e) to learn how to develop integrated educational, counseling, and social reference groups to compensate for negative press from the socioeconomic environment; in particular, to delineate and evalute the effects of specific programs in relation to concomitant programs, school settings or environments and in reference to specific sub-groups such as minority students, the educationally advantaged and disadvantaged, the economically advantaged and disadvantaged and those disposed to unusual creativity and/or achievement;

(f) to learn what characteristics and techniques of teachers, counselors and schools best elicit behavior from youths that is directed toward the realization of their potential, sense of worth, and satisfaction. This includes the determination of the interaction of pertinent variables so that the combination of variables and circumstances most predictive of given criteria for given groups of students can be ascertained with relative accuracy.

In sum, although the research to date has given educational planners and educators much to consider, the research offers little guidance concerning what educational practices should be implemented. Moreover, educational research has been deficient in terms of the size, scope, focus and integration of its research efforts. A comprehensive, on-going, and coordinated program of research and evaluation might well incorporate and integrate into one program such investigations as those undertaken by Flanagan, et al, Jones, et al, Kagan and Moss, Katz, et al, Tillery, et al, Super, Trent and Medsker, and Lehmann and Dressel. That is, the research program should begin with early childhood and include measures of family environment, aptitude, achievement behavior, and personality dimensions; continue through elementary and secondary school, adding variables pertaining to teacher and school characteristics, curricula and program effects as they are related to different kinds of students; then follow-up students who choose various alternatives such as college, employment, and military service as well as the sub-groups of students of both sexes attending different kinds of institutions and entering different fields of employment. Both the college and non-college groups should be measured with respect to cognitive and non-cognitive achievements and satisfactions, aptitudes, abilities, and personality factors.

The effects of school versus non-school experiences, curricula, and academic versus non-academic experiences should be studied in both groups with special attention paid to the problems or difficulties young adults experience in relation to aspects of their personal, educational, and vocational lives. Additional follow-ups and similar measurements should be continued through the adult years. Particular attention should be paid to the determination of possibly critical events and decision points in students' lives, and how the resolutions of such crises are related both to the individuals' characteristics and to the various kinds of educational or non-educational experiences to which they were exposed. At the least, the cognitive abilities as well as the attitudes, values and interests of high school and college alumni should be compared with their scores as seniors. Determination should also be made of which of the non-college attenders attend college later in their lives and which of the "drop-outs" return to college later. Recent evidence suggests that after their children have grown many women return to college to complete undergraduate degrees or to obtain advanced degrees. It is important to know how these women differ from women who have dropped out and stayed out of college. In addition, it is important to discuss how many and what kinds of men go back to school for advanced training or to learn new professions. It is only by dealing with these kinds of issues and obtaining these kinds of data that we can intelligently and definitively answer the questions posed regarding the impact and effectiveness of our entire educational system.

Educational research has established the existence of many critical variables. For this it is to be commended. But, it is time now for explication. The variables must be rigorously and precisely defined in operational terms and the relationships and interactions between the variables must be subjected to systematic, and long-range specification and interpretation. Perhaps then we will have some of the information so urgently needed regarding schools' positive effects on students' growth and development as well as needed effects yet to be attained.

REFERENCES

Allport, G.W., Vernon, P.E., and Lindzey, G., Study of values: Manual (rev. ed.). Boston: Houghton Mifflin, 1951.

Astin, A.W., Differential college effects on the motivation of talented students to obtain the Ph.D. Journal of Educational Psychology, 54 (1), 1963, 63-71.

Astin, A.W., and Panos, R.J., The educational and vocational development of college students. American Council on Education, 1969.

Averch, H.A., Carroll, S.J., Donaldson, T.S., Kiesling, H.J., and Pincus, J., How effective is schooling? A critical review and synthesis of research findings. California: Rand Corp., 1972.

Bachman, J.G., et al. Youth in transition, Vol. I., Blueprint for a Longitudinal Study of Adolescent Boys. Institute for Social Research, University of Michigan, Ann Arbor, Michigan, 1969.

Bachman, J.G., Youth in transition, Vol. II., The impact of family background and intelligence on tenth-grade boys. Institute for Social Research, University of Michigan, Ann Arbor, Michigan, 1970.

Bailey, B., Characteristics of high school seniors as related to subsequent college attendance. Report no. CRP-2152, Morgantown: West Virginia University, 1966.

Baird, L.L., The educational goals of college-bound youth. ACT Research Report No. 19, Iowa City: American College Testing Program, 1967.(a)

Baird, L.L., Family income and the characteristics of college-bound students. ACT Research Report No. 17, Iowa City: American College Testing Program, 1967. (b)

Beardslee, D.C. and O'Dowd, D.D., Students and the occupational world. In N. Sanford (Ed.), The American College. New York: Wiley, 1962, 597-626.

Berdie, R.F., and Hood, A.B., Decisions for tomorrow. Minneapolis: University Press, 1965.

Berelson, B., and Steiner, G.A., Human behavior: An inventory of scientific findings. New York: Harcourt, Brace, 1964.

Bordin, E.S., A theory of vocational interests as dynamic phenomena. Educational Psychology Measurement, 1943, 3, 49-65.

Bordua, D.J., Educational aspirations and parental stress on college. Social Forces, 1960, 38, 262-269.

Bowles, R.T., and Slocum, W.L., Social characteristics of high school students planning to pursue post high school vocational training. Final Report, No. 17. Report No. BR-7-0031, Washington, D.C.: Research Coordinating Unit for Vocational Education, June, 1968.

Bowles, S., and Levin, H., More on multicollinearity and the effectiveness of schools. Journal of Human Resources, 3, No. 1, Winter 1968, 2-24.

Brackbill, V., and Jack, D., Discrimination learning in children as a function of reinforcement value. Child Development, 1958, 29, 185-190.

Bridgman, D.S., Where the loss of talent occurs: why?. In College Entrance Examination Board (ed.) The Search for Talent; College Admissions, New York: College Entrance Examination Board, 1960, 30-45.

Brittain, C.V., Adolescent choices and parent-peer cross pressures. American Sociological Review, 1963, 28, 385-391.

Bronfenbrenner, U., The changing American child. In Ginzberg, E. (Ed.), Values and Ideals of American Youth. New York: Columbia University Press, 1961. 73-84.

Brown, D.R., Non-intellective factors and faculty nomination of ideal students. Rep. to the College Entrance Examination Board of a Pilot Study. Mellon Foundation. Vassar College, 1959.

Bruemmer, L., The condition of women in society today: a review, Part I. Journal of the National Association of Women Deans and Counselors, 1969, 33, 1180125.

Buffa, E., Operations Management. Second ed.; New York: Wiley, 1968.

Caplin, M.D., Self-concept, level of aspiration and academic achievement. Journal of Negro Education, 1968, 37, 435-439.

Christiansen, J.R., et al, Educational and occupational progress of rural youth in Utah--a follow-up study. Brigham Young University, Provo, Utah, Report No. SS-BULL-2, Washington, D.C.: Department of Agriculture, 1962.

Claudy, John, Educational outcomes, in Five years after high school, Project TALENT, American Institutes for Research and University of Pittsburgh, 1971.

Coleman, James S., *Equality of educational opportunity*. National Center for Educational Statistics, U.S. Department of Health, Education and Welfare, U.S. Government Printing Office, Washington, D.C., 1966.

Colorado State University. *A continuation of the 1963 high school graduates follow-up study*. Fort Collins: Colorado State University, 1966.

Coster, J.K., Some characteristics of high school students from three income groups. In R. Grinder (Ed.), *Studies in adolescence*. New York: Macmillan, 1963.

Crandall, V., Parents attitudes and behaviors and grade school children's academic achievements. *Journal of Genetic Psychology*, 1964, *104*, 53-56.

Creager, J.A., et al, *National norms for entering college freshmen-Fall 1969*. ACE Research Report, 4 (7), Washington, D.C.: American Council on Education, 1969.

Cronbach, L. and Snow, R., Final report: *Individualized differences in learning ability as a function of instructional variables*, Stanford University, Stanford, 1969.

Cross, K.P., College women: A research description. *Journal of the National Association of Women Deans and Counselors*, 1968, 32, 21-25.

Dahlstrom, W.S., Personality. *Annual Review of Psychology*, 21, 1970, 1-48.

Dinklage, L.B., *Adolescent choice and decision-making--a review of decision-making models and issues in relation to some developmental stage tasks of adolescence*. Report No. CRP-C-04, Cambridge: Graduate School of Education. Harvard University, 1966.

Delavan, F.E., *Second annual follow-up study of former high school pupils*. Report No. RR-9-SER-1965-66, Sacramento, California: City Unified School Districts, 1966.

Dellas, M. and Gaier, E.L., Modes of conformity of freshmen women at differently oriented colleges. *Journal of Educational Research*, 1969 62, 370-374.

Dement, A.L., The college woman as a science major. *Journal of Higher Education*, 1962, 33, 487-490.

Douvan, E., and Adelson, J., *The adolescent experience*. New York: Wiley, 1966.

Drabick, L.W., Perceived sources of influence upon occupational and educational expectations. Educational Research Report No. SER-8, Raleigh: North Carolina State University, 1967.

Dressel, P.L. and Lehmann, I.J., The impact of higher education on student attitudes, values and critical thinking abilities. The Educational Record, 1965, 46, 248-258.

Donovan, J.D., The academic man in the Catholic college. New York: Sheed and Ward, 1964.

Douvan, E. and Kaye, C., Motivational factors in college entrance. In N. Sanford (Ed.), The American College. New York: Wiley, 1962, 199-224.

Eckland, B.K., College dropouts who came back. Harvard Educational Review., 1964, 34(3), 402-420.

Elder, G.H., Jr., Achievement orientations and career patterns of rural youth. Sociology of Education, 1963, 37, 30-58.

English, H.B. and English, A.C., A comprehensive dictionary of psychological and psychoanalytical terms. New York: Longmans, Green, 1961.

Epps, E.G., Correlates of academic achievement among northern and southern urban Negro students. Journal of Social Issues, 1969, 25, 55-70.

Epstein, C.F., Women's place. Berkeley and Los Angeles: University of California Press, 1970.

Erickson, E.H., Growth and crises of the healthy personality. In C. Kluckhohn, H.A. Murray, and D.M. Schneider (Eds.), Personality in Nature, Society, and Culture. New York: Knopf, 1956, 185-225.

Feldman, K.A., and Newcomb, T.M., The impact of college on students. San Francisco: Jossey-Bass, 1969.

Fenske, R.H., Association between local college availability and plans for college attendance of public high school seniors with differing attributes and socioeconomic characteristics. Paper presented at the Annual Meeting of the American Educational Research Association,1966.

Flanagan, J.C., et al, Project TALENT, Studies of the American high school, Monograph 2. University of Pittsburgh, Pittsburgh, Pennsylvania, 1962.

Flanagan, J.C., et al, Project TALENT, The American high school student. Final Report for Cooperative Research Project No. 635, Pittsburgh: Project Talent Office, University of Pittsburgh, 1964.

Flanagan, J.C., and Cooley, W.W., Project TALENT: One-year follow-up studies. Cooperative Research Project No. 2333, Pittsburgh: University of Pittsburgh, 1966.

Flanagan, J.C., et al, *Project TALENT: Five years after high school*, American Institutes for Research and University of Pittsburgh, Pittsburgh, Pennsylvania, 1971.

Freedman, M.B., *Impact of college*. New Dimensions in Higher Education, No. 4, U.S. Department of Health, Education and Welfare, Office of Education (OE-50011). Washington, D.C.: U.S. Government Printing Office, 1960.

Freedman, M.B., *The college experience,* San Francisco: Jossey-Bass, 1969.

Frieden, B., *The feminine mystique*. New York: Dell, 1963.

Grant, C.W., A follow-up of spring, 1966, high school graduates in the state of Utah, *Personnel and Guidance Journal*, 1968, *47*, 157-162.

Greeley, A.M.,*Religion and careers*. New York: Sheed and Ward, 1963.

Greeley, A.M., Continuation in research on the "religious factor". *American Journal of Sociology*, 1969, *75*, 355-359.

Grinder, R.E., *A study of the influences of the father's job and social goals of youth*. Final report. Report No. BR-5-0121, Madison: University of Wisconsin, 1967.

Gurin, P., Gurin, G., Las, R.C., and Beattie, M., Internal-external control in the motivational dynamics of Negro youth. *Journal of Social Issues*, 1969, *25*, 29-53

Havighurst, R.J. and Neugarten, B.L., *Society and education.* (3rd ed.) Boston: Allyn and Bacon, 1967.

Heckhausen, H., *The anatomy of achievement motivation*. New York: Academic Press, 1967.

Heist, P. and Yonge, G. *Omnibus personality inventory manual*. New York: Psychological Corporation, 1968.

Hilton, T.L., *A study of intellectual growth and vocational development*, U.S. Department of Health, Education and Welfare, March, 1971.

Hoffman, L.W., and Hoffman, M.L., *Child development research*, Vol 2. New York: Russell Sage Foundation, 1966.

Hollingshead, A.B., and Redlich, F.C., *Social class and mental illness: A community study*. New York: Wiley, 1958.

Holtzman, W., The changing world of mental measurement and its social significance. *American Psychologist*, *26*, 1971, 546-553.

Hoyt, D.P. and Kennedy, C.E., Interest and personality characteristics of career-motivated and homemaker-motivated college women. Journal of Counseling Psychology, 1958, 5, 44-48.

Hunt, D.E., and Hardt, R.H., The effect of upward bound programs on the attitudes, motivation, and academic achievement of Negro students. Journal of Social Issues, 1969, 25, 117-129.

Husen, Torsten (Ed.), International study of achievement in mathematics: A comparison of twelve countries. Stockholm: Almquist and Wiksell; New York: Wiley, 1967.

Jencks, C., and Riesman, D., The academic revolution. New York: Doubleday, 1968.

Jennings, M.K.and Niemi, R.G., Family structure and the transmission of political values. American Political Science Review, March, 1968.

Jensen, A., Another look at culture fair testing. In Hellmuth, J. (Ed.), Disadvantaged Child. New York: Brunner/Mazel, 1970, 3, 53-101.

Jensen, A., How much can we boost IQ and scholastic achievement? Harvard Educational Review, 39, 1969.

Jones, M.C., Bayley, N., MacFarlane, J.W. and Honzik, M.P. (Eds.) The cause of human development. Waltham, Mass,: Xerox College Publishing, 1971.

Kagan, J., and Moss, H.A., Birth to Maturity. New York: Wiley, 1962.

Kahl, J.A., Educational and occupational aspirations of "common man" boys. Harvard Educational Review, 1953, 23, 186-203.

Karman, F.J., Women: personal and environmental factors in role identification and career choice. Unpublished doctoral dissertation, University of California, Los Angeles, 1972.

Katz, J., and associates. No time for youth. San Francisco: Jossey-Bass, 1968.

Katz, J., A critique of personality approaches to Negro performance, with research suggestions. Journal of Social Issues, 1969, 25, 13-27.

Keyserling, M.D., Continuing education for women--a growing challenge. Paper presented at the twenty-second National Conference on Higher Education, Chicago, March 1967.

Knupfer, G., Portrait of the underdog. Public Opinion Quarterly, 1947, 11, 103-114.

Komarovsky, M., *Women in the modern world: Their education and their dilemmas*. Boston: Little, Brown, 1953.

Krech, D., and Crutchfield, R.S., *Elements of Psychology*, New York: Knopf, 1962

Kroll, Arthur M., et al, *Career development: Growth and crises*, New York: Wiley, 1970

Kurland, N.D., *Transition from school to college: New dimensions in higher education.* No. 17 Durham: Duke University, 1967.

Lavin, D.E., *The prediction of academic performance; a theoretical analysis and review of research*. New York: Russell Sage Foundation, 1965.

Lehmann, I.J., and Dressel, P.L., *Critical thinking, attitudes and values in higher education*, Michigan State University, East Lansing, Michigan, 1962.

Lehmann, I.J., and Dressel, P.L., *Change in critical thinking ability, attitudes, and values associated with college attendance*. U.S. Department of Health, Education and Welfare, Office of Education, Cooperative Research Project #1646. East Lansing, Michigan: Michigan State University, 1963.

Lehmann, I.J., Sinka, B.K., and Hartnett, R.T., Changes in attitudes and values associated with college attendance. *Journal of Educational Psychology*, 1966, 57, 89-98.

Lindstrom, D.E., *Factors affecting post-high school: Educational and job plans of rural youth in eight Illinois counties in the 1963-64 school year*. Report No. AES-Bull-731, Urbana, College of Agriculture, University of Illinois, 1968.

Maryland State Department of Education. *Our dropouts: What can schools do?* 1963.

Mathis, H.I., Relating environmental factors to aptitude and race. *Journal of Counseling Psychology*, 1968, *15*, 563-568.

McCandless, B., *Childhood and adolescence*. New York: Holt, 1961.

McClelland, D.C. (Ed.), *Studies in motivation*. New York: Appleton-Century-Crofts, 1955.

McClelland, D.C., *The achieving society*. Princeton: Van Nostran, 1961, McPartland, J., The relative influence of school and of classroom desegregation on the academic achievement of ninth grade Negro students. Journal of Social Issues, 1969, 25, 93-102.

Medsker, L.L., and Trent, J.W., The influence of different types of public higher institutions on college attendance from varying socioeconomic and ability levels. Cooperative Research Project No. 438, Berkeley: Center for the Study of Higher Education, University of California, 1965.

Morey, A.I., Pace, C.R., and Trent, J.W., Institutional profiles: Normative report for upperclassmen. Los Angeles: Center for the Study of Evaluation, University of California, 1970.

Myrdal, G., Economic theory and underdeveloped regions. London: Duckworth, 1959.

Newcomer, M., A century of higher education for American women. New York: Harper, 1959.

Newcomb, T.M., Personality and social change--Attitude formation in a student community. New York: Dryden Press, 1943.

Newcomb, T.M. and Wilson, E.K., (Eds.), College peer groups. Chicago: Aldine, 1966.

Newcomb, T.M. and associates, Persistence and change: Bennington College and its students after twenty-five years. New York: Wiley, 1967.

Pace, C.R., The measurement of college environments. In R. Tagiuri and H. Litivin (Eds.), Organizational climate: Explorations of a concept. Boston: Graduate School of Business Administration, Harvard University, 1968.

Painter, E.G., Women: the last of the discriminated. Journal of the National Association of Women Deans and Counselors, 1971, 34, 59-63.

Pearl, A., The school dropout problem. Rochester, part I. New York Division for Youth, 1962.

Perry, W.G., Jr., Forms of intellectual and ethical development in the college years. New York: Holt, Rinehart and Winston, 1968.

Plant, W.T., Longitudinal changes in intolerance and authoritarianism for subjects differing in amount of college education over four years. Genetic Psychology Monographs, 1965, 72, 247-287.

Plant, W.T., and Minium, E.W., Differential personality development in young adults of markedly different aptitude levels. *Journal of Educational Psychology*, 1967, *58*, 141-152.

Popham, W.J., The performance test: A new approach to the assessment of teaching proficiency, *Journal of Teacher Education,* 1968, 19 (2), 216-222.

Rand, L., Masculinity or feminity? Differentiating career-oriented and homemaking-oriented college freshman women. *Journal of Counseling Psychology*, 1968, *15*, 451-458.

Rehling, R.A., *Selected determinants of adolescent educational expectations*. Reports No. BR-5-0217-OP-12, Eugene: University of Oregon, 1966.

Richards, J.M., Jr., and Holland, J.L., *A factor analysis of student "explanations" of their choice of a college.* ACT Research Report, No. 8. Iowa City: American College Testing Program, 1965.

Roe, Anne, *The psychology of occupations*. New York: Wiley, 1956.

Rosenthal, R., and Jacobson, L., *Pygmalion in the classroom--teacher expectations and pupils' intellectual development*. New York: Holt, Rinehart and Winston, 1968.

Ryder, R., Birth to maturity revisited: a canonical reanalysis. *Journal of Personality and Social Psychology*, *7*, 1967, 168-172.

Sampson, E.E., Birth order, need achievement, and conformity. *Journal of Abnormal and Social Psychology*, 1962, *64*, 155-159.

Sanders, W.B., Osborne, R.T., and Brien, J.E., Intelligence and academic performance of college students of urban, rural and mixed backgrounds. *Journal of Educational Research*, 1955, *49*, 185-193.

Sanford, N. (Ed.)., Personality development during the college years. *Journal of Social Issues*, 1956, *12*(4).

Sarri, R.C., and Vinter, R.D., *School goals, social class, and pupil careers.* Paper presented at the 44th annual meeting of the American Orthopsychiatric Association, 1967.

Schleyer, M.B., *The relationship between religious background and intellectuality in college*. Unpublished doctoral dissertation. University of California, Los Angeles, Los Angeles, 1972.

Schoenfeldt, L.F., Ability, family socioeconomic level and advanced education. Paper presented at the annual conference of the American Educational Research Association, Chicago, 1968.

Schwartz, J., Medicine as a vocational choice among undergraduate women. Journal of the National Association of Women Deans and Counselors, 1969, 33, 13-18.

Sechrest, L.B., The motivation in school of young children: Some interview data. Journal of Experimental Psychology, 1962, 30, 327-335.

Selinger, A.D., The American Indian graduate: After high school, what? Portland: Northwest Regional Educational Laboratory, 1968.

Seron, M.S., Analysis of factors which determine choice of college among urban, suburban, and rural high school students. OEO Project No. 7-E-049, Los Angeles: University of California 1967.

Sewell, W.H., The educational and occupational perspectives of rural youth. Washington, D.C.: National Committee for Children and Youth, 1963.

Shaw, M.C. and McCuen, J.T., The onset of academic underachievement in bright children. Journal of Educational Psychology, 1960, 51, 103-108.

Shaycoft, Marion F., Project TALENT, The high school years: Growth in Cognitive Skills. American Institutes for Research and School of Education, Pittsburgh, Pennsylvania, 1967.

Shill, J.F., Educational aspirations, expectations, and abilities of rural male high school seniors in Mississippi. Report.

Smith, M.S., Equality of educational opportunity: The basic findings reconsidered. In F. Mosteller and D.P. Moynihan (Eds.), On Equality of Educational Opportunity, New York: Vintage Books, 1972.

Simpson, R.L., Parental influence, anticipatory socialization and social mobility. American Sociological Review, 1962, 27, 517-522.

Solomon, D., Adolescents' decisions: a comparison of influence from parents with that from other sources. Marriage and Family Living, 1961, 23, 393-395.

Spranger, E., Types of men (Translated by P.J.W. Pigors). Halle: Niemy, 1928

Stinchcombe, A.L., *Rebellion in a high school*. Chicago: Quadrangle, 1969.

Strodtbeck, F., et al, *Social status in jury deliberations*. American Sociological Review, 1957, 22, 713-719.

Suczek, R.F., and Alfert, E., *Personality characteristics of college dropouts.* Berkeley: University of California, Department of Psychiatry, Student Health Service, 1966.

Super, Donald E., A theory of vocational development. *American Psychologist*. Vol. 8(4), 1953, 185-190.

Super, D.E., *The psychology of careers*. New York: Harper, 1957.

Super, D.E., and associates. *Floundering and trial after high school, career patterns study*: monograph IV. Teacher's College, Columbia University, New York, 1967.

Telford, C.W., and Plant, W.T., *The psychological impact of the public two-year college on certain non-intellectual functions*. US Office of Education, Cooperative Research Project No. 914, San Jose State College. San Jose, California, 1963.

Terrell, G., Jr., et al., Social class and the nature of incentive in discrimination learning. *Journal of Abnormal and Social Psychology*, 1959; 59, 270-272.

Thelan, H., *Classroom grouping for teachability*. New York: John Wiley and Sons, 1967.

Thistlethwaite, D.L., *Effects of college upon student aspirations*, Office of Education, Department of Health, Education, and Welfare, Washington, D.C., 1965.

Thomas, A.H., *Counselor response to divergent vocational goals of a female client in terms of acceptance appropriateness and need for further counseling*. Unpublished doctoral dissertation. Michigan State University, 1967.

Tillery, D., *The educational rites of passage*. Paper presented at the annual meeting of the California Association of Women Deans and Vice-Principals, 1969. (Mimeo.) (a)

Tillery, D., *School to college: distribution and differentiation of youth*. Berkeley: Center for Research and Development in Higher Education, University of California, 1969. (Mimeo.) (b)

Tillery, D., *The teacher on the guidance team*. Adapted from a paper presented at the annaul meeting of the American Personnel and Guidance Association, 1969. (Mimeo.) (c)

Tillery, D., Donovan, D., and Sherman, B., Helpfulness of parents, school personnel and peers to students with different educational aspirations. Paper presented to the American Psychological Association, San Francisco, 1968. (Mimeo.).

Tillery, D., Sherman, B., and Donovan, D., Scope grade eleven profile 1968 questionnaire selected items, a descriptive report from the Center for Research and Development in Higher Education, University of California, Berkeley. New York: College Entrance Examination Board, 1969.

Tillery, D., and Collins, C., College going in four states: A study of differential outcomes of high school graduates, SCOPE Project, Center for Research and Development in Higher Education and the College Entrance Examination Board. New York:1972a.

Tillery, D., and Kildegaard, T., Educational goals, attitudes, and behaviors: A differential study of high school seniors, SCOPE Project, Center for Research and Development in Higher Education and the College Entrance Examination Board, New York: 1972b.

Torrance, E.P., Motivating the creatively gifted among economically and culturally disadvantaged children. In J.C. Gowan and G.D. Demos (Eds.), The disadvantaged and potential dropout. New York: Thomas, 1966.

Trent, J.W., Catholics in college: Religious commitment and the intellectual life. Chicago: University of Chicago Press, 1967.

Trent, J.W., and Medsker, L.L., Beyond high school, San Francisco: Jossey-Bass, Inc., 1968.

Trent, J.W., The decision to go to college: An accumulative, multivariate process. In Trends in Postsecondary Education. Washington, D.C., U.S. Government Printing Office, 1970.

Veroff, J., and Peele, S., Initial effects of desegregation on the achievement motivation of Negro elementary school children. Journal of Social Issues, 1969, 25, 71-91.

Warner, H. Lloyd, Social class in America: A manual of procedures for measurement of social status. New York: Harper and Row, 1960.

Webster, H., Freedman, M.B., and Heist, P., Personality changes in college students. In N Sanford (Ed.), The American College, New York: Wiley, 1962, 811-846.

Whiteman, P.H., Attitudes toward child rearing, personal characteristics, and religious group membership, Madison: University of Wisconsin, 1962. (Mimeo.)

Wright, D.M., Junior college students' view of women's roles. Journal of the National Association of Women Deans and Counselors, 1967, 30, 71-77.

APPENDIX

MATRICES OF FINDINGS AND VARIABLES

INTRODUCTION TO MATRICES

The General Educational Development Model and the synthesis of findings presented in this volume were derived from the matrices of findings and variables displayed in this Appendix. As mentioned previously, not all of the findings in the Analytical Review studies were summarized in the matrices of findings. Only those findings which met the following criteria were selected:

(1) relevance to the Office of Education's Longitudinal Study of Educational Effects;

(2) contribution to a developmental theory of human growth;

(3) generalizability to or implications for a large population of individuals.

The findings are organized according to the four original conceptual models described in Chapter 1 : 'Personal Development, Cognitive Development, Educational Development, and Vocational Development. The variables are organized and presented within the reconceptualized General Educational Development Model presented in Figure 3. of this report.

Capsule descriptions of the samples used in each study as well as the abbreviations or matrix reference key for each study are described on the following pages.

The reader is referred to Volume II of this project for a more comprehensive description of the sample and study designs.

STUDY: SAMPLE DESCRIPTION	MATRIX KEY
Astin (1963) Longitudinal study (1957-1961). Initial sample: 6,544 college students selected from 82 institutions participating in the National Merit Scholarship Testing Program, 1957. Subsequent follow-up four years later. Cross validation study of 1,098 students from the same 82 institutions.	(A)
Astin & Panos (1969) Longitudinal study (1961-1965). Initial sample: 127,217 college students selected from 246 accredited four-year colleges and universities in the U.S. Retest in 1965 of a random sample drawn from the original group of students.	(A&P)
Bachman (1967) Longitudinal study (1966-1969). Initial sample: Probability sample consisting of 2,200 high school males from 87 U.S. public high schools. Supplementary discretionary sample of 300 high school males from 10 outstanding public high schools. A cross-sectional study of the data collected in the 1966 study on the original sample was reported in 1970.	(B)
Coleman (1966) Cross-sectional study of a two-stage probability sample of public elementary and secondary schools in the U.S. Sample: 900,000 students (grades 1,3,6,9, and 12) and principals from 1,170 high schools and 3,223 elementary schools.	(C)

STUDY: SAMPLE DESCRIPTION	MATRIX KEY
Hilton (1971) Longitudinal study (1961-1969). Initial sample: 32,000 students from 27 U.S. public high schools in 17 communities (included junior high schools which fed into high schools), with retests every two years. Several sub-studies of various sub-samples of the original group were also reported in 1971.	(Hil)
Husen (1967) Cross-sectional survey (1961-1965). 12 countries were included in this study. Within each country four types of samples were obtained from a two-stage probability sampling procedure. Samples: 150,000 students, 13,000 teachers and 5,300 headmasters.	(H)
Kagan & Moss (1962) Longitudinal study (1929-1958) studying the first 14 years of life. Sample: total population of Fels Research Institute in 1929 (89 children) and their mothers. Follow-up of the same subjects between the ages of 19 and 29.	(K&M)
Katz (1968) Longitudinal study (1961-1965). Initial sample: 2,014 UC Berkeley freshmen and 1,303 Stanford University freshmen. Subsequent interviews of sub-sample and retesting of initial sample as seniors in 1965.	(K)
Lehmann & Dressel (1962) Longitudinal study (1958-1962). Initial sample: approximately	(L&D1)

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STUDY: SAMPLE DESCRIPTION	MATRIX KEY
Lehmann & Dressel (1962) continued 2,746 Michigan State University freshmen. Subsequent interviews of sub-samples at the end of each year.	
Lehmann & Dressel (1963) Longitudinal study (1958-1962). Experimental sample: 1,188 Michigan State University students who had completed 10 quarters. Control group: 613 Michigan State University students who had withdrawn before they had finished 10 quarters.	(L&D2)
Jones (1972) Ongoing longitudinal study beginning in 1928. Initial sample of 248 "normal" children at age 21 months (and their families) chosen randomly from babies born in Berkeley, California. Test--retest on same sample from age 21 months to 40 years.	(M)*
Newcomb (1967) Longitudinal study (1935-1964). Initial sample: total population of 1938-1940 graduating class of Bennington College for Women (N=117). Subsequent follow-ups of original sample as seniors and 20 years later plus non-graduates from the classes of 1936-1942 (N=168). Sampling of students at all class levels in 1961-1962 (N=309).	(N)
Super (1967) Longitudinal study (1951-1963). Approximately 200 males (grades 8 and 9) from Middleton, N.Y. with subsequent follow-up in the 12th grade and again at age 25.	(S)

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*The publication of the Berkeley Growth data presented in Jones et al (1972) appeared after the matrices were completed and had been referenced throughout to the original investigator, Jean MacFarlane.

STUDY: SAMPLE DESCRIPTION	MATRIX KEY
Flanagan (1971) Ongoing longitudinal study beginning in 1957. Probability sample: 400,000 students in grades 9-12 from 987 high schools and 238 junior high schools. Test--retest of several subsamples. Information was also collected from school personnel.	(TAL)*
Thistlethwaite (1965) Longitudinal study (1959-1963) Initial sample: 26,771 National Merit Scholarship Qualifying Test examinees from 140 colleges and univerisites. 1961 follow-up of students from a stratified random sample of colleges. Final follow-up in 1963 of 2,919 students from original sample.	(T)
Tillery et al (1972) Longitudinal study (1966-1972) Initial sample: 56,061 9th grade students and 40,986 12th grade students and a final sample of 3,954 students from 244 public schools and 55 non-public schools selected from California, Illinois, Massachusetts and North Carolina. Subsequent follow-ups of classes and sub-groups.	(SCOPE)
Trent and Medsker (1968) Longitudinal study (1959-1968) Initial sample: approximately 10,000 high school graduates from 40 high schools chosen from 16 communities in the Midwest, Pennsylvania and California. Subsequent follow-up of students who entered college (persisters and withdrawals) and those who did not enter college.	(T&M)

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*All the findings from the several project TALENT studies have been referenced in the text to Flanagan, et al and to TAL in the matrices.

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex	Proportionately fewer high aptitude females than males who did not attend college were undecided about their educational plans at the end of grade 12. There was a tendency for these females to relinquish earlier ambitions (e.g. at grade 12, 15% reported they were attracted to "creative" occupations, but only 3.8% anticipated they would pursue such occupations). (SCOPE) More high school males expected to enter engineering than any other field; the largest percentage of females expected to become secretaries, typists & office clerks. (TAL) The level of interest or motivation to excel in mathematics was found to be greater among high school males. (H) Females were less likely to go to college than males, but once enrolled they were more likely to graduate. (A&P;SCOPE;TAL;T&M) Sex had the second greatest predictive power of final major field & career choice--college males moved toward "masculine" majors & careers & females toward more "feminine" careers & majors. (A&P) The strongest predictors of subsequent doctoral degree aspirations among college undergraduates were initial level of aspiration, sex, & career choice. (A;T) The vast majority of females aspiring to graduate school planned (cont)	Although males who did not go to college started out with higher educational aspirations than females, non-attending females' level of involvement in school was considerably higher than that of males over the four years of high school, as evidenced by the grades achieved. Males who did not attend college could be identified primarily by underachievement accompanied by alienation from the "system". Non-attending females showed neither the alienation nor the despair of the males. The non-attending females reflected traditional lower class values in both school achievement & in their renunciation of college or career plans which might act to retard marriage. Short-term college attenders tended to be more fully ingrained in the "system"; they had commitment to the work ethic, were more religious, & were more inclined to be interested in the various activities open to them. They tended to accept more responsibility for their present success & failures & for their future goals. More females than males viewed marriage as a barrier to college attendance. (SCOPE) Within both college & employed samples, men were significantly less religiously oriented than women. (T&M)		Males did better than females on aptitude tests in natural science & social science. (A&P;Hil)	Females achieved higher scores in reading & writing than males at the 7th, 9th & 11th grade levels. (TAL) High school males achieved at a higher level than females in mathematics, even when the level of mathematics instruction was held constant. Males were consistently superior whether problems were verbal or computational. (H;Hil) Over 40% of the high school males enrolled in vocational curricula, but only 17% of the females enrolled in business curricula, continued their education. (Hil) Although a greater proportion of females than males obtained a college degree within four years after entering college, when females superior academic records were taken into account, they were more likely than males to withdraw from college. (A&P) There was a greater discrepancy between aspiration to enter graduate school & actual entry for college women than for men; a minority of women expressing plans to enter graduate school immediately did so; a considerable majority of the men expressing plans did so. (T)	High school males were more dissatisfied with teachers than were females; females were more dissatisfied with counselors. Best-liked teachers acted as an "upward push" for considerably more females than males. (SCOPE) Regrets about not having gone to college were directly proportional to academic aptitude for males; the higher the aptitude, the greater the percentage of regrets. (TAL)

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex (cont.)	to work for a master's degree only; most students with interests in and plans to obtain the doctoral degree were males. (A&P;SCOPE;TAL;T&M)					

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Race	Negroes reported very high levels of motivation & interest & aspirations compared to whites of comparable economic levels. Mexican-American students had lower aspirations than Negroes; Oriental Americans had the highest motivation & aspiration to college. (C;SCOPE) There was a greater preference for vocational education among Negroes than among Caucasians. (C) No significant relationship was found between curriculum & race. Within each curriculum, Negroes achieved lower scores than their Caucasian counterparts. Negroes in academic programs had test scores similar to non-academic Caucasian students. (Hil) Race had a few scattered relationships to final major field choice. Negro students were more likely than other college students to choose a career in the health professions & to have a social science major. (A; A&P)			Caucasians tended to score highest on intelligence tests followed by Negroes in integrated schools, other racial minorities, Negroes in northern segregated schools & Negroes in southern segregated schools. (B) The average minority student (except Oriental Americans) scored distinctly lower on standardized achievement tests at every grade level than the average Caucasian student. Moreover, deficiency in achievement was progressively greater for the minority students at progressively higher grade levels. (C) In the 5th grade, Negro students were about one year behind Caucasians on mathematics & verbal aptitude tests--the gap increased over the years--by 11th grade, the Negro students were from 2 to 4 years behind Caucasian students on these tests. (Hil)	The high school dropout rate of Negroes was higher than that of Caucasians. (C) Substantial intelligence & achievement test score differences existed between Negro & Caucasian future teachers at both freshman & senior levels with approximately 15% of the Negroes exceeding the average score of the majority students in the same region. This gap widened in the South where most Negro teachers were being trained. (C) Students from minority racial backgrounds (except Orientals) were more likely to withdraw from college than Caucasians. (A&P) Differences in the mean growth of Negroes & Caucasians may be a function of family background; parents of Caucasians had more schooling & were working in higher status occupations than parents of Negro students. (Hil) The educational aspirations of high school minority students exceeded their actual enrollments. More Negro students in California than the other three states had aspirations at least equal to those of Caucasian students. Mexican-American students in California & Illinois had lower aspirations than Negro students; Oriental students in California had higher aspirations than Caucasian students. Most minority students who entered college went to junior colleges. (SCOPE) Minority students in high school, except Orientals, had far less conviction than Caucasians (cont.)	The great majority of American children attended schools that were largely segregated; but considering all groups, Caucasian children were the most segregated. Nationally, Negro students had fewer of some of the facilities related most to academic achievement, such as less access to physics, chemistry, & language laboratories; fewer books per pupil in libraries; insufficient supply of textbooks; accredited schools & curricula built around an academic program. Puerto Ricans had less access to vocational curricula as well. In addition, the average Negro student attended a school where the principal was (cont)

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Race (cont.)					that they could affect their own environments & futures. When they did however, their achievement was higher than that of Caucasians who lacked that conviction. (C)	Negro: the counselors were less experienced; teachers were less likely to rate students high on motivation & ability, more likely to teach large classes, and less able as measured by type of college attended, years of teaching, & scores on tests of verbal competence. Mexican-Americans, Indian Americans, & Oriental Americans, attended schools with pupil environments very similar to those of Caucasians. Negroes attended colleges where there was a less favorable academic environment (measured in terms of overall grade average in school); fewer faculty had Ph.D.'s; & the institutions had higher dropout rates. (C)

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES SKILLS BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Race (cont.)						

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Academic Aptitude, Intelligence & Grade-point Average	High aptitude high school students contrasted with low aptitude students were more likely to be enrolled in a college preparatory curriculum. (TAL) Educational plans & aspirations to enter scientific & technical occupations were related to mathematics scores although relationships were neither very high nor consistent. Interest in & attitudes toward mathematics were also related to total mathematics scores. (H) From 7th grade on, students who were to later choose academic programs had significantly higher scores on ability & achievement tests than students who later entered non-academic curricula. Students who later chose vocational curricula achieved higher scores on tests of science aptitude than students who selected other non academic programs, & also maintained this lead. (Hil) A high level of educational aspiration was associated with a high grade point average & high intelligence & academic aptitude test scores in high school. (A&P;B;L&D,1;TAL;TA;T&M) Academic aptitude was a good predictor of career choices in some fields; college students with superior academic records were more likely to make stable choices or to end up choosing careers in college teaching, law, physical science & medicine. Students with higher grades tended to be interested in biological sciences, engineering & physical sciences & mathematics; students with poorer grades tended toward business & education. (A&P) (cont.)	Males with high intelligence test scores tended to have positive self-concepts of their school ability more frequently than males with low scores. (B) Males at one select university (but not at a second comparison university) who reported an intellectual orientation toward college had the lowest grade-point average; compared to grade- & vocational-oriented students the grade-oriented group of males had the highest grade point average at both institutions. (K)	High school males with high intelligence test scores compared to males with low intelligence test scores tended to have a higher level of political knowledge. (B)	High aptitude high school students compared to low aptitude students tended to have started school earlier, to have enrolled in college preparatory courses to a greater extent, to have spent more hours per week studying, & to have aspirations for obtaining more education. (TAL)	Achievement & intellectual mastery during childhood & adulthood were highly correlated with IQ. (K&M) Those students who later dropped out of high school obtained scores on ability & achievement tests which were significantly lower than students who continued through the 11th grade. (Hil) Academic aptitude was significantly related to graduation from a 4 year college within 5 years after high school graduation. (A&P;TAL;T&M) Academic aptitude, however, did not account for most college withdrawals. (T&M) The most important single determinant of level of achievement as a college senior was academic ability as measured during high school. Mathematical aptitude was the best predictor of subsequent level of achievement in natural science. Overall academic ability was the best single predictor of achievement in social sciences. (A&P) Although academic aptitude was related to persistence in college, a vast majority of persisters' & withdrawals' academic aptitude scores overlapped. However, less than 7% of the persisters were at the low level of ability compared to 15% of withdrawals. But 44% of the males & 46% of the females who withdrew were at the high level of academic ability. (T&M) (Cont.)	Feelings of regret about not having gone to college were directly proportional to academic aptitude; the higher the aptitude, the greater the percentage of regrets. (TAL)

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Academic Aptitude, Intelligence & Grade-point Average (cont.)	Academic aptitude was a significant predictor of males & females' disposition to do graduate work. (T)				Aptitude was consistently related to post high school educational attainments. For women, however, curriculum had a more significant impact on educational attainments than aptitude. (Hil) Academic aptitude at college entry was associated with entry into graduate school. (T;T&M)	

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Early Childhood Behaviors	Desire for status & social recognition in adults were highly correlated with achievement behavior during childhood. (K&M)				Achievement in adulthood was positively related to achievement behavior in childhood. (K&M)	
Age			Twenty to 30% of high school students in grade 9 knew more about many subject-matter fields than did the average student in grade 12. But variability within grades was greater than variability between grades. (TAL)		In just about every case, grade 9 ability in a particular achievement & aptitude area made a "very substantial" contribution to grade 12 ability in the same area. (TAL) There were no significant differences in the rate of achievement growth from 5th to 7th grades when dropouts were compared to persisters. Age in the 5th grade was the best single predictor of later withdrawal from high school; students who later dropped out were approximately one year older than those students who did not eventually drop out. (Hil) In school systems admitting pupils at the age of 6, students obtained mathematics scores at age 13 which were superior to those obtained by students in systems admitting children at age 5 or 7. (H)	

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Personality Characteristics & Disposition		Students who felt a college degree was necessary for the kind of work they wanted to do tended to have higher than average scores on the Culture, Leadership, & Mature personality scales. (TAL) College students who were most concerned about preparation for a career were the most practical both as freshmen & as seniors. (K)		Scores on the Mature Personality & Self-confidence scales were related to high school students' effort, work habits, interests & attention. (TAL)	The pupil attitude factor which bore a stronger relationship to achievement than all the "school" factors together was the extent to which an individual felt that he had some control over his own destiny. There was, in addition, a correlation between positive self-concept & achievement for "advantaged" students; for "disadvantaged" students, the correlation was nigh between achievement & perception of the environment as responsive & supportive. (C) Manifest failure to assume responsibility for one's own destiny was a characteristic of high aptitude students who did not attend college. Almost half of the high school students in the lowest quartile of the intellectual predisposition scale neither planned to go nor went to college & almost half of the students in the highest IPD quartile enrolled in four-year institutions. In addition, high aptitude non-attenders compared to their college-going peers exhibited a greater lack of self-confidence, apathy, pessimism & alienation; fewer were convinced that they had the ability to do college work. (SCOPE) There was a significant relationship between critical thinking ability & academic achievement in natural sciences, social sciences & humanities. (L&D,1) Personality development & growth of autonomy were most evident for persisters, especially after 4 years; college males' mean scores (cont)	

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Personality Characteristics & Disposition (cont.)					on autonomy scales increased by 6 standard points whereas employed males showed a decrease of 1 standard point; college students' mean score on the Social Maturity scale increased by nearly 10 standard points & employed high school graduates' scores increased 3.5 points. Persisters tended to be more intellectual, self-reliant & open-minded before entering college & even more intellectually oriented & autonomous after 4 years compared to peers who withdrew from college & particularly those who did not attend college. Persisters compared to withdrawals or non-attenders showed significantly greater esthetic appreciation, greater positive change in autonomy, greater tendency towards reflective thought, tolerance for ambiguity, intellectual orientation, interest in cultural activities (e.g. preference for classical music) & were less religious in orientation. (T&M)	
Psychological Adjustment & Maturity	Choosing between going to college to develop a philosophy of life versus preparing for a job was not an immediate concern for high school seniors. (SCOPE)		A major adjustment for many college students, particularly those from rural areas, was the awareness that they were not "first" anymore in the academic, athletic & social competition. (K)			

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Educational Aspirations, Motivations, & Interests	There was a positive relationship between educational aspirations & students' problems in: 1) deciding upon a college major, 2) determining which college is most compatible to one's interests & abilities, & 3) deciding what to do if rejected by the college of first choice. (SCOPE) Many high school seniors were unrealistic in their career plans with large percentages expecting to enter a professional or technical field. (H1;TAL) This remained the case for high school graduates who went on to two-year colleges. (T&M)		Differences in the relative levels of information that an individual displayed often reflected his pattern of interests more than his pattern of abilities. (TAL)		Students' attitudes had a stronger relationship to achievement than all school characteristics combined. (B; C) Planning to go to college did not appear to have any great effect on 12th grade achievement & aptitude scores but was associated with students' choice of careers. Although 73% of the high school males & 58% of the females expected to attend college at some time, only 49% of the senior males & 35% of the senior females were enrolled in college within a year after graduation. (TAL) Level of mathematics achievement was found to be positively related to level of educational aspiration & to aspiration for scientific or technical occupations. (H) Lack of ambition was a key characteristic of high aptitude students who did not attend college. (SCOPE) Academic aspiration at college entry was associated with entry into graduate school. (T)	
MISCELLANEOUS **Marital Status**					Being single at the time of high school matriculation was associated with completing four years of college & obtaining a degree. (A&P)	

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Social/ Political						
Cultural/ Aesthetic						

EDUCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

SPIRITUAL, RELIGIOUS, HUMANISTIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Attitudes, Orientations & Experiences	Religion had a few scattered relationships to final major field choice. Jewish students were more likely to be in or to enter law or medicine. Students whose parents were Catholic showed a tendency to change from or to avoid education. (A&P)					
COGNITIVE Kinds of Learning				The average high school student apparently did not solve simple reasoning problems as well as he memorized & applied simple rules, like the rules of capitalization. Less than 20% of reading comprehension & abstract reasoning variances typically were subject to modification during the high school years. Even smaller percentages of arithmetic reasoning & vocabulary variances were subject to change. (TAL)		
VOCATIONAL Interests, Attitudes, Orientations & Experiences						

EDUCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Socioeconomic status (SES)	Low SES high school students tended more to enroll in general or vocational programs whereas high SES students tended more to be in academic programs. (H;Hil;TAL;T&M) Moreover, as students progressed, SES increasingly discriminated among curricular groups, with higher SES students over-represented in college preparatory programs. (Hil) There was a positive relationship between SES and plans to go to college. (B;SCOPE;TAL;T&M) Other than in California (availability of junior colleges) those students from average or below average family income levels were more likely to have no plans to go to college & not to go than to have plans to go to college but then not go. (SCOPE) A high level of educational aspiration (desire for a graduate degree) was positively related to family income & to plans for obtaining a professional degree; it was negatively related to plans for an "academic" graduate degree. Students from less affluent families planned disproportionately to obtain the M.A. & tended towards engineering & teaching. Students from wealthier families were more likely to be interested in business or law. College students whose fathers were clergymen, lawyers, physicians or teachers tended disproportionately to choose the same occupations. (A&P)	High school males from high SES homes compared to males from low SES homes tended to have more positive self-concepts of their school ability. (B;T&M)			There was a positive relationship between father's occupation or SES & college entrance at all levels of aptitude. However, both students' ability level & level of their fathers' occupation were related to college attendance. (SCOPE;TAL;T&M) College was more closely related to fathers' occupational level than to the students' ability level. (SCOPE;T&M) Students' ability level was more related to college attendance. (TAL) Children of fathers in managerial & professional occupations were more likely to enroll in senior colleges than children of blue collar fathers. (SCOPE;TAL;T&M) Students with high SES backgrounds were more likely to complete college than those from low SES backgrounds. (A&P;SCOPE;TAL;T&M) Socioeconomic status was not a major predictor of college persistence. Although there was a relationship between SES & college persistence, the SES levels of the vast majority of persisters & withdrawals overlapped. (T&M) Only a small minority of withdrawals reported leaving college for financial reasons. (A&P;T&M)	

EDUCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Place of Parents' Birth						
Educational Level of Parents	Educational level of parents was related to students' choice of high school curriculum. Proportionately more students enrolled in academic curricula had fathers who were college graduates compared to students in non-academic curricula. (Hil) Parents' level of education had no relationship to students' career choice or interest in a major field. (A&P) The highest rate of interest in the Ph.D. was found among males whose fathers were college graduates. (A;T)				Achievement & intellectual mastery during adulthood were highly correlated with parental educational level. (K&M) More parents of female withdrawals attended college than those of female non-attenders. (SCOPE) Entry into graduate school was related to parents' educational level, particularly fathers'. (T)	
Size of Family						

EDUCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Psychological Environment of the Home	More students with high aspirations discussed school with parents than did students with low aspirations. Moreover, high aspirants tended to see parents as more helpful than low aspirants. (SCOPE;T&M)	High school males having positive family relationships compared to males having low family relationships tended to have more positive attitudes toward school & more self-esteem & positive social values (kindness, generosity, self-control, responsibility). (B)			Bright non-attenders compared to their college attending peers reported less parental involvement in their educational decisions; less parental encouragement to pursue higher education; feeling less close to & receiving less help from fathers. In addition, proportionately more college-going females reported positive identification with their mothers than bright non-attending females. But the absence of parental models did not appear to be a factor of "great importance" in explaining why high aptitude high school graduates did not enter college. (SCOPE)	
					The relationship between school characteristics & student achievement was reduced for students whose families encouraged achievement. (C)	
					More college persisters than withdrawals & particularly non-attenders reported parents & relatives followed by teachers as their greatest source of help in high school. Friends were considered a source of help in frequency only after family, teachers & counselors. (T&M)	

EDUCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Philosophy of Education in the Home	There was a positive relationship between enrollment in academic curricula & parental encouragement to continue education after high school. (H11;SCOPE;T&M) 80% of those who did not plan to go & did not go to college reported their parents as having minimal educational ambitions for them; 86-94% of those who entered college saw their parents as fully expecting them to earn college degrees. (SCOPE)	Lack of parental encouragement in the pursuit of educational goals was accompanied by a deep sense of alienation between student & parents, particularly father. (SCOPE)		Males showed greater mental acceleration than females when their father was concerned with their educational achievement & where there was parental satisfaction with father's occupation. (M)	Non-attenders reported less parental involvement in decisions about what classes they should take & less encouragement for higher education than did withdrawals. In addition, parents of non-attending females were less encouraging than those of non-attending males & female withdrawals; the belief that "college is for men" was held especially among lower SES groups. Parents expected their sons to get more education than their daughters (as interpreted by students). For those who did matriculate to a four year college or university, however, the aspiration level was higher for females than for males to get their BA, but higher percentages of males reported their parents expected them to go beyond the B.A. to M.A. or doctoral degrees. (SCOPE) Where parents were not concerned with a school's programs, regardless of the money they were willing to spend on education, the school was less effective in terms of post-secondary educational attainment. (H11) The item most predictive of college persistence was parental encouragemen to attend college. (T&M)	
Financial Support for Education					Bright students reported family finances as a barrier to college attendance proportionately less than peers entering college. (SCOPE) Parental financial support of a student was associated with (cont.)	

EDUCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Financial Support for Education (cont.)					completing four years of college & obtaining a degree. (A&P) Financial support by parents was not a major factor associated with student achievement in mathematics. (H) Family resources did not predict entry into graduate school. (T)	

EDUCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Type of High School	Interest in mathematics was strongest in the selective schools, less strong in the comprehensive schools, & weakest in the schools for the remainder of the students after selection had operated. (H) The proportion of students enrolled in academic curricula varied widely among schools & was dependent, in part, upon such variables as: a) presence of a technical high school in the area (increased academic enrollment), b) presence of an open door 2 or 4 year college (decreased academic enrollment), c) job market in the area (effect not specified), d) SES level of parents (higher SES increased academic enrollment).(Hi1)	At college entry, critical thinking ability of students differed according to type of high school attended. Students from public high schools were least stereotypic & dogmatic while students from parochial high schools were most stereotypic & dogmatic & had the highest traditional-value scores. (LAD,1)		Test score patterns of the vocational high school males indicated that although less than 10% of these students went to college, as many as 25% of them had the academic ability to enter & even graduate from college. Vocational school students had high scores on Mechanical Information tests; urban middle-class school students scored significantly lower in Mechanical Information than they did in English. Vocational schools scored the lowest in English & also tended to score low on Reading Comprehension; abstract reasoning scores were near the average. However, although there were differences among schools in students' gains in achievement & aptitude measures, the effects of school versus other environmental influence on student growth were unclear. (TAL)	The difference in mathematics achievement between females & males was greater in non-coeducational schools than it was in coeducational schools. (H)	
Size of High School & Size of Classes					Within the range of school sizes, the best mathematics achievement was in schools with enrollments exceeding 800. The size of class, however, was not related to mathematics achievement nor were the number of hours of math homework or hours of schooling in general. The number of hours of mathematic instruction was related to mathematics achievement. (H) Achievement was not related to the following school characteristics: size of senior class, dropout (cont)	

EDUCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Size of High School & Size of Classes (cont.)					rate, average class size or rural-urban status. (TAL)	Negro children attended elementary school with more pupils per room than Caucasians. (C)
Composition of Student Body		**Negro students in schools with a higher proportion of whites had a greater sense of control over their own destiny. This factor, moreover, was strongly related to achievement. (C)**			Students achieved at a higher level when they were in schools with some or much variability in terms of socioeconomic characteristics than they did when placed in schools that were homogeneous with respect to the socioeconomic background of their peers. (H) Test performance of Negro students in integrated schools indicated positive effects of integration. Although the differences were small, students who entered integrated schools in the early grades recorded consistently higher scores than all other groups. The effect of integration on the reading & mathematics achievement of Negro students held even when SES was taken into account. (C) Schools with the highest performance of Negro students obtained the lowest achievement scores. (Hil)	Negroes are the most segregated of the minorities but considering all groups, white children are the most segregated. (C) There was less intelligence testing at schools with a predominantly Negro or Puerto Rican enrollment than predominantly white schools. (C)

EDUCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Facilities-Resources					There was a small but consistent relationship between some school facilities & students' achievements. Nationally, Negro students had fewer of some of the facilities related most to academic achievement e.g., they had less access to physics, chemistry, & language laboratories; fewer books per pupil in libraries, insufficient supply of textbooks; schools were less often accredited & the curriculum was less often built around an academic program. Puerto Ricans had less access to vocational curriculum as well. In addition, the average Negro student attended schools where 65% of the teachers were Negro whereas Caucasian students' teachers were 97% Caucasian. Negro students more often than Caucasians had Negro principals. The trend, however, was towards Caucasians teaching Negroes, not vice versa. Moreover, the average minority students' achievement was much more affected by the quality of the school's facilities than was the achievement of the average Caucasian student. (C) The level of (math) achievement, persistence in school, & going to college were found to be positively related to amount of per pupil expenditure. (H; TAL) Student achievement in English was related to having an adequate library in the school & having study skills. In addition, the percentage of schools administering scholarship tests was related to the percentage of boys going to college. (TAL)	

EDUCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Curricula	Of all students surveyed, vocational students indicated the most interest in their courses. There was a small relationship between curriculum & post-high school plans. Only 22% of the non-academic students planned to go directly to work or into military service & 34% indicated they would continue their education. For academic students, the figures were 5% and 78% respectively. (Hil) The effects of minority students' participation in project "Head-start" was more manifest in their educational motivation than in their test scores. (C)			At grade 9, vocational students achieved higher scores on STEP Listening tests when compared to other non-academic students, but fell behind all other groups on STEP Reading & Social Studies tests. (Hil) For all four curricula studied, underachievers when compared to overachievers: 1. did more non-school related reading in their leisure time. 2. more often had fathers who did not encourage them to go on to college. 3. spent more time outside school on technological or vocational activities. (Hil)	The average Caucasian student's achievement was less affected by his school's curricular programs than was the achievement of the average minority student's. (C) Students who had courses in "new mathematics" achieved higher scores than other students on items in traditional mathematics. (H) Student achievement was significantly related to being in an academic curriculum rather than a vocational high school. In addition, the probability of entering college & graduating was directly related to student's high school curriculum. (TAL;T&M) Prediction of college entry or educational attainment cannot be based on high school curricula; many non-academic students went on to college & a significant number of college preparatory students went directly to work. However, for females, curriculum had a more significant impact on educational attainments than aptitude. The highest correlation between high school curriculum & post-graduation activities was that of students who pursued clerical programs & who went directly to work after high school. (Hil) No significant relationship was found between curriculum & race; within each curriculum Negroes achieved lower scores than their Caucasian counterparts. Negro students in academic programs had test scores similar to non-academic Caucasian students. (Hil)	Minority groups had less access to curricular and extracurricular activities related to academic achievement. Secondary Negro students were less likely to attend accredited high schools especially in the south. Negro and Puerto Rican students had less access to vocational curricula. Caucasian students had the most access to more fully developed extracurricular activities, especially those related to academic matters (e.g., debate teams). (C) Of all students surveyed, vocational students indicated the most interest in their courses and vocational courses were considered to be the most useful. (Hil)

EDUCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Influence of Teachers & Counselors	More students with high aspirations discussed school with school personnel than did students with low aspirations; moreover, high aspirants tended to see school personnel as more helpful than did low aspirants. However, the person talked to most was not perceived as most helpful--counselors & teachers were perceived as more helpful than mother. (SCOPE)			There was a positive relationship between frequency of counselor visitations and "fit" between college aspirations and student's ability, although this was not consistent for all student sub-groups. (C)	Females' best-liked teachers played a special role in their school experiences not apparent for males; parents reinforced the females' own aspirations, but best-liked teacher acted as an "upward push" for considerably more girls than boys. (SCOPE) Student achievement was related to having well-paid & experienced teachers. Students in schools with guidance programs tended to have higher than average test scores but the amount of counseling a student received in high school appeared to have little effect on aptitude and achievement test score gains when initial ability and SES were controlled. (TAL) The quality of teachers showed a strong relationship to student achievement, particularly for minority students and was progressively greater at higher grades indicating a cumulative impact of the qualities of teachers on the students' achievement. Of the teacher characteristics measured, those that bore the highest relationship to student achievement were: the teacher's score on the verbal skills test; the teacher's own level of education & that of his parents. (C) Mathematics achievement & amount of pre-service training of teachers were, in general, related. However, students of university-trained teachers produced insignificantly higher scores than students of teachers trained at teacher- (cont.)	Bright non-attenders reported dissatisfaction with their teachers & counselors who were not enough like the students to empathize with their problems or else dealt with their problems superficially. Apparently, bright non-attenders are not receiving the help they need from teachers & counselors. (SCOPE)

EDUCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Influence of Teachers & Counselors (cont.)					training institutions. (H) Nationally, Negro students had fewer of some of the facilities most related to academic achievement. Negro teachers have generally less favorable training than white teachers & they score lower on tests of verbal competence, especially in the South. (C)	
Influence of Peers	Curriculum enrollment of a student was related to the educational aspirations of his peers. More students enrolled in academic compared to non-academic curricula had friends planning to go to college. (Hil) More students with high aspirations discussed school with the same sex peers whereas students with low aspirations discussed school more with opposite sex peers; low aspirants found more help in the opposite sex peer than in the opposite sex parent. (SCOPE)				Students' achievement was strongly related to the educational background & aspirations of the other students in the school. This effect was less for Caucasian students & Orientals. The average Negro's peers were more often Negro; had less educated mothers; came from broken homes, had larger families; had fewer luxury items in their homes; fewer books in their home; feelings of powerlessness over their environment. Student body characteristics accounted for more variance in schools' achievement than other school characteristics. For example, there was a positive effect of school integration on achievement test scores of Negro pupils, particularly when the pupils entered integrated schools in the early grades & where more than 1/2 of their classmates were Caucasian. (C)	

EDUCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Academic & Non-academic Experiences					Student achievement was predictable to a high degree for most subjects from ability plus amount of exposure to experiences related to the subject matter, e.g., the most important predictors of English achievement were: being in an academic curriculum rather than a vocational high school; having well-paid and experienced teachers; having an adequate library; having study halls, and having considerable homework. (TAL)	Caucasian students had more access to fully developed programs; college preparatory programs & extra-curricular activities related to academic matters (e.g., debate teams & school newspapers). (C)
Persistence/ Withdrawal					Students who later dropped out of high school attained scores on ability & achievement tests which were significantly lower than those of students who continued through the 11th grade. (Hil) 17% of Negro adolescents (aged 16 & 17) dropped out of school, compared to [illegible]% Caucasian adolescents. (C)	

COLLEGE CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
College vs. No College	Students came to college in order to define their identities, to learn skills, & because "it was the right thing to do." (K) The differences in the career goals of bright non-attending males compared to their short-term college attending peers did not account for the non-attenders decision not to enter vocational training. As high school seniors, bright, inventive non-attending girls compared to their "short-term" peers, reported more interest in "creating something original" while "short-termers" reported more interest in "helping other people." (SCOPE)	Lack of ambition and manifest failure to assume responsibility for one's own destiny were key characteristics of bright non-attenders. In addition, bright non-attenders compared to their college-going peers exhibited a greater lack of self-confidence, apathy, pessimism and alienation; fewer were convinced they had the ability to do college work, and felt that the "important things in life are not learned in college." (SCOPE) Proportionately more college-going females reported positive identification with their mothers than high aptitude females who did not attend college. (SCOPE)		Academic aptitude & SES were significantly related to the type of educational institution & training a student entered into after high school (e.g., 4 year college, 2 year college, technical school, armed forces). The relationships were stronger for academic aptitude. (A&P;SCOPE;TAL;T&M)		
DEMOGRAPHIC **Type of College**	Northeastern men's colleges and colleges in the Southwest produced significantly fewer students who aspired to the Ph.D. than would be expected on the basis of input. More students aspired to professional degrees. Technological schools did not differ significantly from other institutions. (A;A&P) Students attending selective private colleges in the Northeast with high budgets (expenditure per student for educational & general purpose) & demanding academic work tended to have high aspirations. Predominantly Negro colleges tended to facilitate students' desire for obtaining a graduate degree. (A&P) (cont.)	Positive change in Social Maturity was greatest for students attending private colleges, less for those in Protestant colleges & least for those attending Catholic colleges. Students within each type of college changed significantly on the autonomy scales between 1959 & 1963. (T&M)		Academic aptitude was significantly related to the type of educational institution & training a student entered after high school graduation (e.g., 4-year college, 2-year college, nursing school, secretarial school, armed forces, trade school). (A&P;SCOPE;TAL;T&M)	Colleges where a relatively large percentage of students work for pay have considerably higher drop-out rates than were predicted by their student input. If a student attended a relatively selective institution where the peer environment was cohesive & the number of employed students was low, he was relatively more likely to persist and obtain a degree than if he attended a large university. Attendance at a university tended to increase a student's chances of dropping out. Both males & females were more likely to drop out of college if they (cont.)	Negro students received lower quality higher education than Caucasians: they attended segregated institutions disproportionately; they enrolled in colleges with a lower proportion of Ph.D. teachers (the faculty in these institutions received comparatively low salaries); they (cont.)

EDUCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Type of College (cont.)	The largest number of graduating seniors expressing interest in graduate school were those from private, non-sectarian universities; following in order private, non-sectarian colleges, public universities, church-related colleges & state colleges. (T&M)				attended a coeducational institution. In institutions where there was a high frequency of informal dating, the dropout rate was higher than expected on the basis of student inputs. (The effects of this variable accounted, in part, for the effects of the non-coeducational institutions' influence on persistence since men's & women's colleges tend to have very little informal dating). When student inputs were controlled, however, institutional quality did not have an effect on students' achievement. Educational achievement was affected by differences that existed prior to matriculation. (A&P)	were more likely to enroll in state colleges than the state university and they were frequently found in institutions with high dropout rates. (C)
					The more select the institution, the greater was the proportion of Caucasians in the student body. Most minority students who entered college went to junior colleges. In all states studied, junior colleges drew almost equally from all SES levels although there were less junior college students from the higher than average family income groups. (SCOPE;T&M)	
					Modest family income was less of a barrier to enrollment in junior colleges than to enrollment in senior colleges. (SCOPE)	

EDUCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Type of College (cont.)					Attendance at a Catholic institution increased a student's chances of persistence & completion of a degree. (A&P;T&M) Persistence in college was lowest for 2-year college students; highest for students in church-related colleges & somewhat higher for "native" students than for transfers from 2-year colleges. (T&M)	

EDUCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Size of College Size of Classes	Size of college, percentage of males & conventional orientation tended to have a negative effect on Ph.D. aspiration; coeducational institutions with equal proportion of males and females had facilitating effects on the Ph.D. aspirations of males. (A)					
Composition of Student Body						
Facilities & Resources						

EDUCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Curricula, Major Fields	There was a greater preference for vocational education among Negroes than among Caucasians and among southerners than among non-southerners. (C) Students' selection of college & major seemed to be determined without conscious choice. (K)	Vocational orientation may have been the strongest influence working against the liberalizing effects of the curriculum; it constricted students' exploring various educational & occupational preferences & goals. (K)	If student & course objectives were not appropriately matched, the possibility increased that students would be frustrated and lose interest in learning and thereby resort to rote memory work only in place of growth in learning. (K)		At college entry, plans to major in Biological or Physical Sciences and Psychology were associated with entry into graduate school. (T) Students who declared business/secretarial or engineering majors when entering college were more likely to drop out than students declaring other majors. In addition, after academic ability, the second two most important predictors of undergraduate achievement were students' intended field of study & career choice at time of matriculation. (A&P)	
PROCESS Influence of Teachers, Faculty Characteristics	Motivation to seek advanced education was strengthened by good teachers in the major field & particulary, major field professors who gave positive evaluations of students' ability. Motivation was weakened by teachers who required rigid adherence to course and curricular requirements & teachers who emphasized the vocational aspects of education. (T)					College seniors & withdrawals were consistent in their evaluations of the qualities of a good teacher--one who makes his student produce, knows the subject matter, teaches in an entertaining manner & grades objectively. (L&D; 1&2) Over two-thirds of both persisters and withdrawals and both males and (cont.)

EDUCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Influence of Teachers, Faculty Characteristics						females described their teachers as enthusiastic. (LAD,2)
Influence of Peers	The motivation to seek advanced education was strengthened by an upperclass environment where there was a strong press from peers for intellectualism or where many peers planned to do advanced work. Motivation was weakened by student subcultures which exhibited press for participation in "play or spectator activities," peers press for social conformity & negative self-evaluations. (T)				Among women whose attitudes were deviant from the prevailing community norm, those who were associated together in a peer subculture of deviants had a lower attrition rate than those not so associated. However, there was no significant relationship between association with peer subcultures (deviant or non-deviant) and persistence in college. (N)	
Academic & Non-academic Experiences	Disposition to seek advanced education was strengthened by participation in graduate level courses, research projects, & recognition such as awards of academic achievement. (T)	As subjects completed more college, they were more likely to cite academic experiences as having an impact upon them. Such experiences included classes and teachers in the major fields. University females indicated that they were influenced by non-academic experiences more than did male subjects, such experiences being friends, dating, and living away from home. First and second-year withdrawals, (cont.)				No significant differences appeared among university females regarding items pertaining to how interesting classes were. For men, however, the more college attended, the more the (cont.)

EDUCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Academic & Non-academic Experiences (cont.)		on the other hand, frequently indicated that non-academic aspects of college life, such as friends, "bull sessions", and merely living away from home, had more of an effect upon them than academic experiences. In addition, male university withdrawals cited general education courses as having a greater impact on their attitudes & behavior than did seniors, who stressed major field experiences. (L&D,2)				opinion was expressed that classes were interesting. (L&D,2)
Persistence/ Withdrawal	The more exposure a student had to college, the more likely he was to express aspirations to do postgraduate work; the greatest increase in desire to attend graduate school, particularly for women, occurred during the last two years of undergraduate school. (T) There were no significant differences between amount of college attended and certainty of future plans, although proportionately fewer seniors had definite plans than freshman withdrawals. Overall, over 50% of the males and over 40% of the females were uncertain of what they would be doing in the immediate future. (L&D,2) Some significant relationships were found between amount of college attended and planned participation in community activities: students with more college tended to plan more on taking part in country clubs and in (cont.)	Persistence in school & liberal political attitudes were significantly & positively correlated. Women whose attitudes deviated from the community norms had a higher attrition rate than those whose attitudes were congruent. (N) Out of a wide array of variables, individual items most predictive of college entry and persistence were students' perception of the importance of college and their certainty of graduating from college. Eventual persisters compared with withdrawals and particularly nonattenders reported as high school seniors "liking high school very much"; college to be "extremely important"; to be certain of graduating from college; and to have primarily academic reasons rather than vocational or other reasons for attending college. (T&M) (cont.)		Academic aptitude and SES were significantly related to graduation from a 4-year college within 5 years after high school graduation. Academic aptitude, however, did not account for most college withdrawals. (A&P;TAL;T&M) Only a minority of withdrawals reported leaving college for academic reasons. (A&P;T&M) The academic aptitude scores of a considerable majority of persisters & withdrawals overlapped. (T&M)	Although nearly 2/3 of the class (of 1965) completed 4 years of college work, only 1/2 obtained a B.A. during this time. Of the students who dropped out of the first college, more than 1/2 enrolled at a second institution. (A&P)	A significant percentage of seniors were not satisfied with their grades. (L&D,2) No significant differences appeared among university females regarding items pertaining to how interesting classes were. For men, however, the more college attended, the more the opinion was expressed that classes were interesting. (L&D,2)

EDUCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Persistence/ Withdrawal (cont.)	**cultural functions. (L&D,2)** **There were no differences between amount of college and plans to participate in the PTA and in men's or women's clubs. (L&D,2)**	Persisters tended to be more intellectual, self-reliant & open-minded before entering college & even more intellectually oriented & autonomous after 4 years compared to peers who withdrew from college & particularly those who did not attend college. Persisters compared to withdrawals or non-attenders showed significantly greater esthetic appreciation, greater positive change in autonomy, greater tendency towards reflective thought, tolerance for ambiguity, intellectual orientation, interest in cultural activities (e.g., preference for classical music) & were less religious in orientation. (T&M)				
		Regarding ratings of the importance of vocational and general education goals, persisters and withdrawals were similar in believing in the value of "a well-rounded education", although as freshmen they had stressed more vocational preparation as an important objective in college education. Seniors placed greater stress on the importance of a general education geared toward the appreciation of knowledge. (L&D,2; T&M)				
		Although a majority of both persisters & withdrawals felt that academic and social development should receive equal stress in college, the females varied significantly in their responses to this item: female freshman withdrawals most often indicated that these two areas should receive equal emphasis and the female seniors most often disagreed. When asked what factors in colleges (cont.)				

EDUCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Persistence/ Withdrawal (cont.)		resulted in high prestige among both students and faculty, both persisters and withdrawals agreed that academic values, including qualities such as originality, creativity, scholarship and dedication to studies, were important. Over 60% of university persisters and withdrawals felt that all students should be required to take general education courses. Although there were no important differences between male persisters and withdrawals, the degree of support for general education courses varied among female subjects: women who withdrew were more favorably disposed towards general education requirements than were senior women. Both persisters and withdrawals and men and women varied significantly on opinions that college was harder than originally anticipated. For men, this conviction decreased the longer they were in college. More females than males who withdrew felt college was less hard than they had expected. Seniors stressed the importance of good grades more than freshmen withdrawals. (L&D,2)				
		There were significant differences among students attending college different lengths of time with respect to their belief that faculty members should be permitted to hold whatever political or ideological views they wished. The percentage holding this view increased with the amount of college attended. (cont.)				

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Persistence/ Withdrawal (cont.)		Freshman withdrawals were more emphatic in their opinion that faculty must not try to inculcate their beliefs in their students. No definite patterns emerged according to amount of college attended and opinions. There was general agreement among persisters and withdrawals, both sexes, that Red China should not be admitted to the U.N.; that the Federal government should provide care for the elderly; that the U.S. should not stop atmospheric nuclear tests; that heavy petting was a permissible sexual outlet for unmarried students; and that someone employed in a skilled trade was as worthwhile to society as a professional worker. But the evidence did not determine whether seniors were more or less conservative than the withdrawals. (LAD,2)				

EDUCATIONAL DEVELOPMENT

COMMUNITY CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Region	There was a greater preference for vocational education among Negroes than among Caucasians & among southerners than non-southerners. (C) Schools in economically depressed communities had many students with unrealistic aspirations. (Hil)	There were regional differences in students' deciding "what kind of student to be." (SCOPE)		Negroes in the South who participated in Head Start programs scored higher on tests of verbal & non-verbal ability than students who did not participate. But they did not score consistently higher than students from communities where the program was not offered, suggesting that self-selection into the program accounted for the differences. (C)	On certain STEP tests & at certain levels, academic Negroes in one town achieved higher scores than Negroes tested in another town, suggesting that location may affect achievement. (Hil) Regional differences in facilities related to academic achievement were even greater than majority & minority differences (e.g., 95% of Negro and 80% of Caucasian high school students in the metropolitan Far West attended schools with language laboratories compared to 48% and 72%, respectively, in the metropolitan south. Negro students were less likely to attend accredited high schools, especially in the South. The relationship between achievement of Negroes and teacher qualities was over twice as great for southern Negroes compared to northern Negroes; achievement of Negroes was also most related to peer characteristics in the South. In addition, 100% of Negro high school students & 97% of Caucasians in the metropolitan Far West attended schools having a remedial reading teacher compared with 45% & 65% respectively in the metropolitan South & 4% & 9% in the non-metropolitan Southwest. By grade 12, both Caucasian & Negro students in the south scored below their counterparts in the north. In addition, Southern Negroes scored farther below Southern Caucasians than Northern Negroes scored below (cont.)	For Negroes & Caucasians, segregation was most nearly complete in the South, but was extensive also in all the other regions where the Negro population was concentrated: the urban north, midwest & west. (C)

EDUCATIONAL DEVELOPMENT

COMMUNITY CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Region (cont.)					Northern Caucasians. The average Caucasian student's achievement (10%) was less affected by the strength or weakness of his school's facilities, curriculum, & teachers, than was the average minority pupil's achievement (20%) with the exception of Orientals. In the metropolitan North and West, 20% of the Negroes age 16-17 were not in school--a higher drop-out rate than in the metropolitan or non-metropolitan south. (C)	
					Regional differences in achievement were noticeable. Students in the Northeast tended to be above the national average & students in the Southwest below that average. Differences within each region, however, were more striking. In addition, the rate of college entrance was highest in the Far West & Southwest and lowest in the Middle East & New England. Secondary schools in the Southeast & Southwest, however, lacked holding power in comparison with those in other parts of the United States. (TAL)	
					A higher percentage of males than females attended Ph.D. granting institutions in Massachusetts & a larger percentage of both sexes attended community colleges in California than in the other three states. California had a lower proportion of the "non-college did-not-plan-to-go" (cont.)	

EDUCATIONAL DEVELOPMENT

COMMUNITY CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Region (cont.)					high school graduates than any of the other states. The differences between one state and another in percentage of college enrollment was greater than the difference between one sex and another. (SCOPE)	
Urban/ Rural			A major adjustment for many students, particularly those from rural areas, was the awareness that they were not "first" anymore in the academic, athletic & social competition. (K)		The dropout rate in high school varied according to the Metropolitanism of the area as well as by South & Non-South. (C) When level of instruction was removed, the place of parents' residence (rural-urban) was not related to mathematics achievement. (H)	
Socioeconomic Status (SES)	Schools in economically depressed communities had many students with unrealistic aspirations. (Hil)				Students' achievement was not related to the schools' location (rural vs. urban) except that all the urban better quality housing area groups tended to score significantly lower on tests of mechanical information than on tests of English. (TAL)	

EDUCATIONAL DEVELOPMENT

COMMUNITY CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Higher Education Resources					In regions where 2 & 4 year open admission colleges were available, more students enrolled in college. This was particularly evident in Western cities. In the East where there were fewer extension centers & community colleges & more private colleges, fewer students continued their education after high school. (Hil;T&M;TALENT)	

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex	48% of the males and 40% of the females planned to enter a professional field, but census data shows that only 15% of the employed males and 17% of the employed females between the ages of 25 and 29 are in professional and technical occupations. Clearly high school seniors had unrealistic aspirations. 53% of the males and 46% of the females expected to enter college immediately after high school graduation. However, 53% of the males and only 33% of the females expected to graduate from a 4-year college. More males expected to enter engineering than any other field; the largest percentage of females expected to become secretaries, typists, or office clerks. (TAL) Although females discussed career plans with counselors more than did males, females tended to relinquish earlier ambitions by grade twelve, and renounce college or earlier plans which might retard marriage. (SCOPE) Females were less prone than males to choose occupations of a professional nature; to go to college and/or work toward advanced degrees. (A;A&P;SCOPE;TAL;T&M) Sex was the second greatest predictor of final major field, career choices in college and subsequent doctoral degree aspirations. Males moved toward "masculine" careers and females toward "feminine" careers. (A;A&P;T) More women than men increased their (cont.)			Passivity and dependency in girls during ages 6-14 was associated in adulthood with concern for husband's and own job security. (K&M)	Males' attainment was related to their initial abilities; females' attainment, however, was related very little to their potential capacities. (M) 49% of senior boys and 35% of girls did enroll in college within one year after graduation. (TAL) More girls than boys saw marriage as a barrier to college attendance. (SCOPE) Although a greater proportion of females than males obtained a college degree within four years after entering college, when females' superior academic records were taken into account, they were more likely than males to withdraw from college. (A&P) There was a greater discrepancy between the aspirations to enter and actual entry of women into graduate school than there was for men. 78% of women aspired to graduate school and only 27% actually enrolled; whereas 89% of the men aspired to graduate schools and 62% did enter. (T)	

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex (Cont.)	desire during their undergraduate years to do graduate work. (T) However, the vast majority of females aspiring to graduate school planned to work for a Master's degree only; most students with interest in & plans to obtain the doctoral degree were males. (A;A&P; SCOPE;TAL;T&M)					
Race	Non-Caucasions, even those with college aspirations, were more likely to be concerned about work vs. college than their Caucasian peers. In addition, the educational (and vocational) aspirations of minority students exceeded their actual enrollments. (SCOPE) No significant relationship was found between curriculum & race. Within each curriculum Negroes achieved lower scores than their Caucasian counterparts. (Hil) There was a greater preference for vocational education among Negroes than among Caucasians. (C) Race had a few scattered relationships to final major field choice. Negro students were more likely to choose a career in the health professions & to have a social science major. (A;A&P)					Negro and Puerto Ricans have less access to college preparatory curriculum; Puerto Ricans have less access to vocational curriculum as well. (C)

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Academic Aptitude, Intelligence & Grade-point Average	There was a positive correlation between intelligence test scores and vocational aspirations. (B;T;T&M) Plans to enter scientific or technical occupations were consistently related to mathematics scores. (B) A greater proportion of high school graduates at a high level of academic aptitude who could be expected to attain a professional occupation or career desired to do so. Moreover, high academic aptitude students who attended college desired a professional vocation in greater proportion than their high academic aptitude, non-college attending peers. (T&M) Students with superior academic records in high school were more likely to make stable choices or to change their choices to college professor, lawyer, scientist, and physician. (A&P)			Agreement between actual abilities and those required by occupations of interest in the 12th grade was a good predictor of realistic reasons for changing jobs & also for floundering-stabilizing behavior (one group only). (S) Intelligence & grade point average in junior & senior high school was consistently related to stabilizing behavior & realistic reasons for changing job position. (S)	The rate of unemployment during the first four years after high school was highest for men at the low level of academic aptitude. (T&M) Wisdom of vocational preference, defined as agreement between actual and needed abilities, was not related to level of occupational attainment. (S) However, intelligence & grade point average in junior and senior high school was a consistently good predictor of career criteria such as realistic reasons for changing jobs; improvement in educational status and educational and vocational levels attained. (B;M;S)	Intelligence & grade point average in junior and senior high school were consistently good predictors of occupational satisfaction at age 25. Wisdom of vocational preferences defined as agreement between actual & needed abilities was only slightly related to occupational satisfaction. (S)
Early Childhood Behaviors	Passivity in males during their first three years was associated with choice of intellectual careers (e.g., music, physics, biology, and psychology). (K&M)				Independence as a child or youth was not related to occupational success. (S) Achievement behavior in childhood was significantly related to achievement behavior in adulthood, intellectual mastery and excellence. (K&M)	Independence as a child or youth was not related to occupational satisfaction. (S)

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Age	There was little stability of career choice over the 5-year period starting with 11th and 12th grades. Only 13% of 11th graders and 19% of 12th graders still planned the career they had chosen in high school, five years later. (TAL)	Even with all the instability of role exploration during adolescence, the extent to which the student identified with the Protestant work ethic was relatively constant across diverse situations. (SCOPE)		Age in grade did not predict stabilizing vs. floundering behavior. However, evaluation of career status at age 25 indicated that the majority were functioning positively; that is, they were engaged in trial, instrumental or establishing behavior. (S)	Age in grade was a consistent predictor of occupational level attained at age 25. (S)	
Personality Characteristics & Disposition	College students' occupational decisions seem to be determined "without conscious choice."(K)	Students who felt that a college degree was necessary for the kind of work they wanted to do tended to have higher-than-average scores on the Culture, Leadership, and Mature Personality scales. (TAL) College students who were most concerned about preparation for a career were the most practical both as freshman & as seniors. (K)			Lack of ambition and self-confidence; apathy and pessimism were key variables in students not attending college. (SCOPE)	

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Psychological Adjustment & Maturity	For high school males and females, there was a negative relationship between the immediacy of the problem of choosing between an available job versus going to college to prepare for a better job and educational aspirations. (SCOPE) The differentiation of self from parents seemed to manifest itself in the realization that the college student didn't want to do what he always thought he would do. (K)			Subjects who felt their assets were utilized in their jobs tended to have made the least number of moves and to have been continually self-supporting. (S)		
Educational Aspirations, Motivations & Interests	Many high school seniors were unrealistic in their career plans with large percentages expecting to enter a professional or technical field. (Hil;TAL;T&M) This remained the case for high school graduates who went on to two-year colleges. (T&M) The best predictor of final major field & career choice was initial choice. (A&P) The strongest predictors of subsequent Ph.D. aspiration were students' initial level of aspiration, sex, & career choice. (A;A&P;T)					
MISCELLANEOUS **Marital Status**					Relationships between marital status at age 25 and vocational development criteria were of a doubtful negative type. (S)	

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATI[illegible]TION & OPPO[illegible]TIES
Social/ Political						
Cultural/ Aesthetic						

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

SPIRITUAL, RELIGIOUS, HUMANISTIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Attitudes, Orientations & Experiences	Religion had a few scattered relationships to final major field choice. Jewish students tended to be interested in law or medicine. Catholic students tended to avoid education. (A&P)					
COGNITIVE Kinds of Learning	Results of cognitive and non-cognitive tests showed roughly equivalent validities for the prediction of career choice with a small advantage for non-cognitive tests. The non-cognitive variables were of more predictive value for occupations such as physician, CPA, clergymen, lawyer, and commercial artist. (TAL)					
VOCATIONAL Interests, Orientations & Experiences	Of all students employed, vocational students indicated the most interest in their courses; and vocational courses were considered to be the most useful. (Hil)	Students who entered employment compared to college peers were more religious in orientation. (T&M)		Maturity of interest in the 12th grade was consistently related to socioeconomically judged stabilizing career behavior after high school. Having high interest scores in occupational fields was not so related. (S) Planning to qualify for the preferred occupation & vocational aspiration level in 12th grade as well as information obtained in high school concerning training and educational requirements & knowledge of the supply & demand for both preferred occupations and all occupations of interest was a good predictor of an individual's (cont.)	Over 40% of high school vocational males, but only 17% of the females enrolled in business curricula, continued their education. (Hil) Only 21% of males and 29% of females did not hold at least one full-time job in the year following high school graduation. 44% found their first full-time job before they left high school; 7% took more than 6 months. (TAL) Maturity of interest in 12th grade & planning for the preferred occupations were positively related to improvement in educational status. (cont.)	More females than males (60% of the females) were satisfied with the job they held one year after graduation; but fewer females than males intended to make a career of this job. (TAL) Occupational information in high school, (cont.).

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

VOCATIONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Interests, Orientations & Experiences (cont.)				realistic reasons for changing positions and improvement of educational status. In addition, the nature of senior high school work experiences had a low but positive relationship to the stabilizing-floundering quality of early adult career behavior but was less tenuous for the self-employed. Participation in high school and out of school avocational activities was consistently related to realistic reasons for changing jobs and to stabilizing or floundering career behaviors. (S)	Vocational aspiration level in the 12th grade as well as occupational information obtained in high school, particularly concerning training and education needed, was positively related to occupational level attained by age 25. The nature of high school work experience was not related to post-high school career development, although in junior high school it may be predictive of less post-high school education. Moreover, participation in high school or out of high school activities relevant to vocational interests was not related to attainment. Vocational adjustment at age 25, however, showed a few significant relationships to vocational development criteria. (S)	particularly concerning training and education needed and maturity of interest in & planning for the preferred occupation in 12th grade were positively related to self-estimated career satisfaction. Participation in high school or out of high school activities relevant to vocational interests was not related to satisfaction, & having been self-employed while in high school was only slightly related to career satisfaction at age 25. In general, the nature of high school work experience was unrelated to occupational satisfaction. Frequent job and training (cont.)

VOCATIONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

VOCATIONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Interests, Orientations & Experiences (cont.)						movement appeared to reflect repeated occupational dissatisfaction. Subjects who attained higher occupational levels expressed more satisfaction in their fields, and felt that their assets were best utilized in their jobs. All measures of satisfaction (position, occupation, utilization of assets and opporunity for self-expression) were positively intercorrelated in both samples. (S)

VOCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Socioeconomic Status (SES)	Low SES high school students tended to enroll in general or vocational programs, whereas high SES students tended more to be enrolled in academic programs. (H;Hil;TAL;T&M) There was a relationship between SES and vocational aspiration (B); the belief that "college is for men" was held especially among lower SES groups. (SCOPE) There was no statistically significant relationship found between SES and occupational choice for any of the groups. (T&M) Parent's income had a relationship with career choice in college. Wealthier students were more likely to remain in or switch to business or law; low income students were more likely to be enrolled in engineering or teaching. Student's final career choice tended to be the same as father's if he was a clergyman, lawyer, physician, or teacher. (A&P)			Parental occupational level when student was in junior or senior high school was related to realistic reasons for changing jobs and stabilizing vs. floundering career behavior at age 25. (S)	Parental occupational level when student was in junior or senior high school was related to occupational attainment at age 25. But self-estimated career success was related to subject's own attained educational levels, not to comparisons between their levels and those of their father's. (S) The smallest proportion of unemployed youths was at the high SES level; and the greatest proportion was at the low SES level, regardless of any college experience--but paramount among non-college men. (T&M)	Parental occupational level when student was in junior or senior high school was related to occupational satisfaction at age 25. Social mobility of the family, however, was not related to occupational success or satisfaction. (S)
Place of Parents' Birth						

VOCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Educational Level of Parents	The highest rates of Ph.D. aspirations (76%) were found among men who wanted to be either a college teacher or scientific researcher and whose fathers were college graduates. (A) However, parent's level of education had no relationship to student's changes in major field or career. (A&P)				Achievement behavior and intellectual mastery in adulthood were highly correlated with parental educational level. (K&M)	
Size of Family						

VOCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Psychological Environment of the Home	Parents' expectations (as interpreted by students) were greater for their sons than their daughters. Higher percentages of males reported their parents wanted them to obtain an M.A. or doctorate. (SCOPE)					
	There was a positive correlation between positive family relations and vocational aspirations. More students who did not go to college had parents who were disinterested and did not encourage them. (B;SCOPE; T&M)					
	College students were strongly influenced in their choice of occupations by their parents' aspirations as well as by the current fashion and opportunities. (K)					
Philosophy of Education in the Home	Females who have lower educational and vocational aspirations tend to retreat from a positive identification with their mothers; boys have less strong positive identification with their father. (SCOPE)				Parents of females who did not go to college at all were less encouraging than parents of non-attending males or females who went for a short time. (SCOPE)	
	There was a positive relationship between enrollment in academic curricula & parental encouragement to continue education after high school. (Hil;SCOPE;T&M)					

VOCATIONAL DEVELOPMENT

FAMILY CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Financial Support for Education						

VOCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Type of High School	The proportion of students enrolled in academic curricula varied widely among schools & was dependent, in part, upon such variables as: a) presence of a technical high school in the area (increased academic enrollment), b) presence of an open door 2 or 4 year college (decreased academic enrollment), c) job market in the area (effect not specified), d) SES level of parents (higher SES increased academic enrollment). (Hil)			Test score patterns of the vocational high school males indicated that although less than 10% of these students went to college, as many as 25% of them had the academic ability to enter & even graduate from college. Vocational school students had high scores on Mechanical Information tests: urban middle-class school students scored significantly lower in Mechanical Information than they did in English.	Vocational schools scored the lowest in English & also tended to score low on Reading Comprehension; abstract reasoning scores were near the average. However, although there were differences among schools in students' gains in achievement & aptitude measures, the effects of school versus other environmental influence on student growth were unclear. (TAL)	

VOCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Size of High school & Size of Classes						
Composition of Student Body						
Facilities-Resources						

VOCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Curricula	Of all students surveyed, vocational students indicated the most interest in their courses. There was a small relationship between curriculum & post-high school plans. Only 22% of the non-academic students planned to go directly to work or into military service & 34% indicated they would continue their education. For academic students, the figures were 5% and 78% respectively. (Hil) The effects of minority students' participation in project "Head-start" was more manifest in their educational motivation than in their test scores. (C) The highest correlation between high school curriculum and post-graduation activities was that of students who pursued clerical programs and went directly to work after high school. (Hil) College students' vocational orientation may be the strongest influence working against the liberalizing effects of the curriculum; it prevents testing educational and occupational preferences and goals. (K)			At grade 9, vocational students achieved higher scores on STEP Listening tests when compared to other non-academic students, but fell behind all other groups on STEP Reading & Social Studies tests. (Hil) For all four curricula studied, underachievers when compared to overachievers: 1. did more non-school related reading in their leisure time. 2. more often had fathers who did not encourage them to go on to college. 3. spent more time outside school on technological or vocational activities. (Hil) High school curriculum was consistently related to realistic reasons for changing positions and in one sample predicted stabilizing behavior. (S)	Student achievement was significantly related to being in an academic curriculum rather than a vocational high school. In addition, the probablity of entering college and graduating was directly related to student's high school curriculum. (TAL;T&M) Prediction of college entry or educational attainment cannot be based on high school curricula; many non-academic students went on to college & a significant number of college preparatory students went directly to work. However, for females, curriculum had a more significant impact on educational attainments than aptitude. The highest correlation between high school curriculum & post-graduation activities was that of students who pursued clerical programs & who went directly to work after high school. (Hil) No significant relationship was found between curriculum & race; within each curriculum Negroes achieved lower scores than their Caucasian counterparts. Negro students in academic programs had test scores similar to non-academic Caucasian students. (Hil) High school curriculum was consistently related to occupational level attained by age 25. (S)	Minority groups had less access to curricular and extracurricular activities related to academic achievement. Secondary Negro students were less likely to attend accredited high schools, especially in the south. Negro and Puerto Rican students had less access to college preparatory programs and Puerto Rican students had less access to vocational curricula. Caucasian students had the most access to more fully developed extra & curricular activities, especially those related to academic matters (e.g., debate teams). (C) Of all students surveyed, (cont.)

VOCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Curricula (cont.)						vocational students indicated the most interest in their courses and vocational courses were considered to be the most useful. (Hil) High school curriculum was consistently related to occupational satisfaction at age 25. (S)
PROCESS **Influence of Teachers & Counselors**	Discussing jobs with a guidance counselor was not related to future educational or vocational decisions. Counselors were not providing students with information concerning educational training some jobs required. (SCOPE;TAL) Non-attenders were particularly unresponsive to any help from school personnel. (SCOPE)					Discussing jobs with a counselor was not related to satisfaction with job-related decisions. (SCOPE;TAL)

VOCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Influence of Peers	Curriculum enrollment of a student was related to the educational aspirations of his peers. More students enrolled in academic compared to non-academic curricula had friends planning to go to college. (Hil)					
Academic & Non-Academic Experiences	Disposition to seek graduate training was strengthened by participation in honors programs, research projects, and recognition and awards of academic achievements. (T)				Avocational out-of-school activities and participation in general high school activities was consistently related to occupational level attained by age 25 and to number of times unemployed after high school. However, participation in high school or out of high school activities relevant to vocational interests was not related to vocational attainment. (S)	Participation in high school or out of high school activities relevant to vocational interests was not related to satisfaction, & having been self-employed while in high school was only slightly related to career satisfaction at age 25. In general, the nature of high school work experience was unrelated to occupational satisfaction. (S)

VOCATIONAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Persistence/ Withdrawal						

VOCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
College vs. No College	Subjects who had no college experience scored lower on a scale measuring level of vocational aspiration than those who had some college. (S) Proportionately more individuals who attended some form of post-high school, e.g., junior college or vocational school, reported a higher level of vocational aspirations than did those with no post-high school training. (T&M) A large proportion of students who did not attend college were unable prior to high school graduation to state a vocational choice of any kind and most, particularly the women, who did state a choice were vague or indicated unrealistic goals. (SCOPE;T&M) High academic aptitude students who attended college desired a professional vocation in greater proportion than high academic aptitude non-college peers. In fact, college students in general, compared to their non-attending peers identified more with "intellectual" occupations than with "practical" occupations. (T&M)	Lack of ambition and manifest failure to assume responsibility for one's own destiny were key characteristics of bright non-attenders. In addition, bright non-attenders compared to their college-going peers exhibited a greater lack of self-confidence, apathy, pessimism and alienation; fewer were convinced they had the ability to do college work, & felt that the "important things in life are not learned in college." Proportionately more college-going females reported positive identification with their mothers than high aptitude females who did not attend college. 12th graders who did not go to college were more interested in making money than those who went to college even for a short time. (SCOPE) More college persisters than non-college men felt liking their work was important for job satisfaction; more non-college men felt steadiness of employment contributed more to a satisfying job. Those who entered employment compared to college persisters showed less tolerance for ambiguity, less interest in intellectual inquiry, less intellectual and esthetic orientation, and changed less in autonomy. (T&M)		By 4 years after high school graduation, 46% of non-college men and 36% of college withdrawals entered military service. (TAL;T&M)	Positive vocational movement was clearly related to attaining higher levels of education (S;T&M) Proportionately more men with some college experience compared to their non-college peers, held a business-oriented job and fewer industrial trade jobs, four years after high school. Most of the men without college experience were limited to factory jobs; most women to clerical jobs. They did not prefer these jobs and were not happy, but had not changed or improved them. (T&M) Although a considerable majority of college men worked in some area classified as low level technology, proportionately more college non-attenders than withdrawals experienced unemployment (T&M). Men who went to junior colleges or to special schools with specific vocational orientations attained higher occupational levels than did men who had no post-high school training or training limited to military service. Among the men, those who entered military service were the only ones who were represented by a majority at the semi-skilled and unskilled occupational levels. (T&M)	

VOCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEF	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Type of College	Northeastern men's colleges & colleges in the Southwest produced significantly fewer students who aspired to the Ph.D. than would be expected on the basis of input. More students aspired to professional degrees. Technological schools did not differ significantly from other institutions. (A;A&P)					
	Students attending selective private colleges in the Northeast with high budgets (expenditure per student for educational & general purpose) & demanding academic work tended to have high aspirations. Predominantly Negro colleges tended to facilitate students' desires for obtaining a graduate degree. (A&P)					
	The largest number of graduating seniors expressing interest in graduate school were those from private, non-sectarian universities; following in order private, non-sectarian colleges, public universities, church-related colleges & state colleges. (T&M)					
	Students at liberal arts colleges tended to switch out of business, education, and engineering and into art, humanities, and social sciences; they also exhibited less interest in law and more interest in physical scientist, social scientist, physician, or college professor. (A&P)					

VOCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Size of College & Size of Classes	Size of college, percentage of males & conventional orientation tended to have a negative effect on Ph.D. aspiration; coeducational institutions with equal proportions of males and females had facilitating effects on the Ph.D. aspirations of males. (A)					
Composition of Student Body						
Facilities and Resources						

VOCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Curricula, Major Fields	There was a greater preference for vocational education among Negroes than among Caucasians and among southerners than among non-southerners. (C) Students' selection of college & major seemed to be determined without conscious choice. (K) About 75% of students changed their career plans after entering college--ranging from less than 50% of those in nursing and teaching to over 90% of those initially in mathematics, government and diplomatic service. The best predictor of final major field and career choice was initial choice. (A&P) Students who intended to major in biological sciences or psychology entered with and maintained higher aspirations than those in other fields. Women in physical sciences did so also. The greatest increase in aspirations was exhibited by those graduates with degrees in social sciences, education and miscellaneous fields. (T)	Females in non-technical curricula such as social sciences, humanities, & communication arts were less stereotypic and less dogmatic than females in vocationally oriented curricula. (L&D,1) Males at one select university claiming an intellectual orientation to the curriculum had the lowest grade point average of all groups but not at a second select comparison university; the grade-oriented males had the highest grade point averages at both universities. (K)			At college entry, plans to major in Biological or Physical Sciences and Psychology were associated with entry into graduate school. (T) Students who declared business-secretarial or engineering as a career choice at college entrance were more likely to drop out of college than students declaring other majors. (A)	

VOCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Influence of Teachers, Faculty Characteristics						
Influence of Peers	The motivation to seek advanced education was strengthened by an upper-class environment with a strong press from peers for intellectualism, the presence of good teachers in the major field and peer plans to do advanced work. (T) In general, the student's career choice tended to move into closer conformity with the more popular career choices among fellow students. This was particularly evident in the fields of engineering, business and business law. College environments where there was considerable religious activity and little drinking tended to shift students away from careers in the arts and social sciences and into careers such as the clergy, medicine, and teaching. However, when the college environment was viewed independently of its student body, its effects on the individual student's career plans appeared to be trivial. (A&P)					

VOCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Academic & Non-Academic Experiences	Disposition to seek advanced education was strengthened by participation in honors programs, graduate level courses, research projects, & recognition, such as awards of academic achievement. (T)	As subjects completed more college, they were more likely to cite academic experiences as having an impact upon them. Such experiences included classes and teachers in the major fields. University females indicated that they were influenced by non-academic experiences more than did male subjects, such experiences being friends, dating, and living away from home. First and second-year withdrawals, on the other hand, frequently indicated that non-academic aspects of college life, such as friends, "bull sessions", and merely living away from home, had more of an effect upon them than academic experiences. Male university withdrawals cited general education courses as having a greater imprct on their attitudes & behavior than did seniors, who stressed major field experiences. (L&D,2)				
Persistence/ Withdrawal	The more exposure a student had to college, the more likely he was to express aspirations to do post-graduate work; the greatest increase in desire to attend graduate school, particularly for women, occurred during the last two years of undergraduate school. (T) There were no significant differences between amount of college (cont.)	Out of a wide array of variables, individual items most predictive of college entry & persistence were students' perception of the importance of college & their certainty of graduating from college. Eventual persisters compared to withdrawals & particularly non-attenders reported as high school seniors: college to be "extremely (cont.)				

VOCATIONAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Persistence/ Withdrawal (cont.)	attended and certainty of future plans, although proportionately fewer seniors had definite plans than freshman withdrawals. Overall, over 50% of the males and over 40% of the females were uncertain of what they would be doing in the immediate future. (L&D,2)	important"; to be certain of graduating from college; and to have primarily academic reasons rather than vocational or other reasons for attending college. (T&M)				
		Proportionately more college persisters compared with their non-college peers felt that "liking their work" was the most important job characteristic; proportionately more non-college men felt that "steadiness of employment" was most important to job satisfaction. (T&M)				
		Regarding ratings of the importance of vocational and general education goals, persisters and withdrawals were similar in believing in the value of "a well-rounded education", although as freshmen they had stressed more vocational preparation as an important objective of a college education. Seniors placed greater stress on the importance of a general education geared toward the application of knowledge. (L&D,2;T&M)				

VOCATIONAL DEVELOPMENT

COMMUNITY CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Region	The difference between one state and another in % of college enrollment was greater than the difference between one sex and the other. California had a lower proportion of the "non-college-did-not-plan-to-go" graduates than other states. The congruence between the ideal and actual anticipated occupations as related to educational aspirations also differentiated among the states. This congruence tended to increase with the level of educational aspirations for males in California and females in Massachusetts. No. Carolina males with low educational aspirations had more of a problem "deciding what to do if doesn't get the job wanted." (SCOPE)				The rate of college entrance was highest in the Far West & Southwest and lowest in the Middle East & New England. Secondary schools in the Southeast & Southwest, however, lacked holding power in comparison with those in other parts of the United States. (TAL) A higher percentage of males than females attended Ph.D. granting institutions in Massachusetts & a larger percentage of both sexes attended community colleges in California than in the other three states. California had a lower proportion of the "non-college did-not-plan-to-go" high school graduates than any of the other states. The differences between one state and another in percentage of college enrollment was greater than the difference between one sex and other. (SCOPE)	
Urban/ Rural						

VOCATIONAL DEVELOPMENT

COMMUNITY CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ATTITUDES-VALUES-FEELINGS-BELIEFS	SATISFACTION & OPPORTUNITIES
Socioeconomic Status (SES)				The communities from which the smallest proportions of young men entered the military service appeared to have fairly stable economies. (T&M)	The highest percentage of professional workers in the sample were found in relatively small and economically depressed communities where there was a comparative lack of competition. (T&M)	The highest percentages of men who were still in their home communities four years after high school graduation were in cities that offered good job opportunities to young men on their way up. (T&M)
Higher Education Resources	College attenders followed the pattern of accessibility characteristic of their state (e.g., with 74 community colleges, California had 35% of its sample enrolled in 2-year colleges). (SCOPE;T&M)					

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex		At college entry males compared to females were significantly more stereotypic & dogmatic, placed more emphasis on theoretical, political & economic values, & were more oriented toward emergent values. Females had higher academic aptitude scores, were better readers, placed more emphasis on esthetic, social religious values, & were more oriented toward traditional values. (L&D,1) With few exceptions, persisters and withdrawals of both sexes showed an increase over a 4-year period in critical thinking ability, a trend towards traditional values, a decrease in stereotypic beliefs, dogmatism, authoritarianism & unreceptivity to new ideas. Persisting males moved more toward emergent values than did the male withdrawals all of whom moved toward an increasing orientation toward traditional values; the less college attended, the greater the movement toward traditional values. For females, however, only freshmen withdrawals became more traditional in their value orientation; for the rest of the females, the more school completed, the more oriented they became to emergent values. There were no significant differences between persisters & withdrawals or between sexes with respect to degree of change in dogmatism. All groups became less dogmatic. Regardless of time spent in college, there was a decrease in stereotypic thinking. Only for the females were there significant differences between persisters & withdrawals when degree of change was considered: (cont.)	High school males acquired significantly more information than females in many areas. High school males made significantly larger gains than females on achievement tests in mathematics, physical science, aeronautics & space, electricity & electronics, mechanics & sports. Females made significantly larger gains than males in literature information, memory for words, spelling & home economics information. For males, the largest gains were in math, literature, accounting, business, sales & law. Females showed their largest gains in the same fields except math information which dropped considerably. (TAL) High school males were consistently superior to females in mathematics, whether problems were verbal or computational. (H)	There was no sex difference in IQ or mental growth rates of children, but there was a genetic sex difference in the persistence of effects of early experiences. Parent-child resemblances in ability scores occurred at an earlier age in females than males; father-daughter & mother-daughter correlations (between education of parent & child's IQ) were significant at 3½ years; father-son & mother-son correlations were significant at 5 years. Individual differences in mental abilities became stabilized earlier in females than in males. There was an increase in growth of the parent-son resemblance until 14-15 years suggesting a maturing of mental functions in males until adolescence. By age 6, IQ's of both sexes were fairly stable. Females' test scores were relatively less stable after 16 years. Males scored higher than females on verbal intelligence tests between 16-21 years, but there was no sex difference on verbal scales between 26-36 years. Females scored consistently higher on performance scales. (M) Most sex differences found in patterns of information reflect differences in interests. High school males made significantly larger gains on aptitude tests of creativity, mechanical reasoning, visualization in three-dimensions & abstract reasoning was almost a half a standard deviation higher. (TAL) (cont.)	There are somewhat different patterns of mental growth between the sexes as evidenced by differences in gains on achievement tests. High school males made significantly larger gains than females on achievement tests in mathematics, physical science, aeronautics & space, electricity & electronics, mechanics & sports. Females made significantly larger gains than males in literature information, memory for words, spelling & home economics information. For males, the largest gains were in math, literature, accounting, business, sales & law. Females showed their largest gains in the same fields except math information which dropped considerably. For almost all variables, the sex showing the larger average gain between grades 9 & 12 was also the sex with the higher mean score on that variable in grade 9. (TAL) Although a greater proportion of females than males obtained a degree within 4 years after entering college, when females' superior academic records were taken into account, they were more likely than males to withdraw from college. Males achieved better than females in natural science & social science. (A&P)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex (cont.)		the longer a female stayed in college the less she adhered to stereotypic beliefs. More females than males reported that after 4 years they had come to respect views contrary to their own. However, only for males was the amount of college attended significantly related to an increase in this self-reported change. For women only, there was a direct positive relationship between amount of college & increase in: tolerance of nonconformist dress or behavior, interest in politics & scientific developments, conviction that an individual can determine the quality of education received more than the institution, & the perceived importance of money. Also, the more college attended, the less a female indicated a respect for persons in authority. Only males felt they had increased in their critical reasoning abilities. (L&D,2)		College females had higher academic aptitudes & were better readers than men. (L&D,1)		

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Race		Minority students in high school, except Orientals, had far less conviction than Caucasians that they could affect their own environments & futures. When they did, however, their achievement was higher than that of Caucasians who lacked that conviction. (C)		Caucasians tended to have the highest scores on intelligence tests followed by Negroes & other racial minorities in integrated schools, Negroes in northern segregated schools, and lastly Negroes in southern segregated schools. Negroes' scores were distinctly lower on both verbal & non-verbal tests at every level. (B;C) The discrepancy between Caucasian & minority students' test scores were cumulative; at 12th grade, minority students' scores were further below the Caucasian students than they were at the first grade. (C) Tests of aptitude & records of achievement have historically been barriers to Negroes' higher education. (SCOPE) Substantial test score differences existed between Negro & Caucasian future teachers at both college freshman & senior levels. This gap was widest in the South, where most Negro teachers were being trained. (C)	The average minority students' achievement was more affected by the strength or weakness of the schools' facilities, teachers & curricula than was true for the Caucasian students. For grades 6, 9 & 12, the highest average test scores were obtained by Negroes whose classmates were more than 50% Caucasian. Students who entered integrated schools in the early grades attained consistently higher scores than other groups, particularly on reading & mathematics achievement tests. (C)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Academic Aptitude, Intelligence & Grade point Average	Interest in mathematics was related to mathematical ability in all elementary & high school samples. (H) Differences in the relative levels of information an individual displayed often reflected his pattern of interests more than his abilities. (TAL)	College students who scored high in the cognitive area tended to exhibit less stereotypic beliefs, less dogmatism & be less oriented toward traditional values. The exception was females majoring in medical technology who were both high in aptitude & high in stereotypy. There was a positive correlation between final examination grade & critical thinking, values & attitudes. There was a relationship between exam grades & dogmatism & stereotypic beliefs but no significant relationship was found between performance & traditional-value orientation for either males or females. (L&D,1)	There was a positive correlation between intelligence test scores & political knowledge among high school students. (B)	Although mental test scores after age 4 were relatively stable, there were some individuals at all age periods whose mental growth was irregular; between ages 6 & 18 years, 60% changed 15 or more points; 33% changed 20 or more points; 9% changed 30 or more points; 15% showed less than a 10 point change. (M) Energy level of fathers correlated negatively with intelligence test scores of both male & female children; mothers' energy level correlated positively with mental growth. (M) The child's own mental test scores at age 2 correlated only .30 with his IQ at 18. Males & females were equally stable in their test scores regardless of level of intelligence. (M) Achievement behavior & intellectual mastery in childhood & adulthood were highly correlated with IQ for both females & males. (K&M) The most important single determinant of level of achievement as a college senior was academic ability as measured during high school. (A&P)	The correlation between IQ & educational level for males was .67 to .79. The variability in educational levels was small for females; females were not achieving in accordance with their potential capacities. (M) There was a very high relationship between high school achievement in English & achievement in mathematics. For almost all the variables, the sex showing the largest average gain between grades 9 & 12 was also the sex with the higher mean scores on these variables in grade 9. Two variables, Abstract Reasoning & Vocabulary 1, together were found to account for much of the general ability factor entering into the various grade 12 scores. (TAL)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Early Childhood Behaviors	Achievement behavior during childhood was associated with the need for social recognition & desire for status in adulthood. (K&M)		Important common factors found among students in grades 9 & 12 were mathematical ability; spatial relations; English & technical information. (TAL)	Achievement behavior & intellectual mastery in early childhood & adulthood were highly correlated with IQ for both males & females. (K&M) Intelligence by school age was fairly constant, but intellectual potential for continued learning & growth was unimpaired through age 36, especially in the attainment of information & word knowledge. (M)	Achievement behavior during childhood was significantly related to achievement in adulthood, intellectual mastery & competence. (K&M)	
Age						

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Personality Characteristics & Disposition	Grade-oriented college students showed the least tolerance for ambiguity over the four years; they were the most rigid, cynical, pessimistic, immature & tied to their parents. (K)	Males were significantly more stereotypic & dogmatic than females & were oriented toward emergent values while females were oriented toward traditional values. Males scored higher on the theoretical, political & economic scales of the Study of Values; females scored significantly higher on the aesthetic, social & religious scales. (I&D,1)			The pupil attitude factor which bore a stronger relationship to achievement than all the "school" factors together was the extent to which the individual felt he had control over his own destiny. Minority students (except Orientals) had less conviction than Caucasians that they could control their own futures. (C)	
Psychological Adjustment & Maturity						

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Educational Aspirations & Motivations		At college entry, critical thinking, values & attitudes varied according to the level of students' educational aspirations. Males & females who desired more education tended to be less stereotypic, less dogmatic & more emergent in their values than those who aspired to 4 years of college or less. (L&D,1)	College freshmen who scored highest on Social Maturity were those pursuing intellectual interests. (K)	A high level of educational aspiration was associated with a high grade point average & high intelligence & academic aptitude test scores in high school. (A&P;B;L&D,1; TAL;T&M)	Planning to go to college did not have any spectacular effect on 12th grade achievement scores aside from its motivational factor in a student's choice of classes. (TAL)	
					Males at one select institution (but not at a second comparison university) who claimed an intellectual-orientation to college had the lowest grade-point-average compared to the vocational or grade-oriented group; the grade-oriented males had the highest grade point averages at both institutions. (K)	
MISCELLANEOUS						
Marital Status				Being married within 5 years after high school was inversely related to both academic aptitude & SES with the relationship to SES stronger & both relationships stronger for males than females. (TAL)	Being single at the time of high school matriculation was associated with completing four years of college & obtaining a degree. (A&P)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Social/ Political		Increases in intellectualism & individualism were more frequent among college students whose initial social attitudes were congruent with the prevailing community social norms than among those whose attitudes were initially incongruent. (N)				
Cultural/ Aesthetic		There was a positive correlation between "serious" reading & liberalism in political attitudes. (N)				

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

SPIRITUAL, RELIGIOUS, HUMANISTIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Attitudes, Orientations & Experiences		Critical thinking & social maturity (autonomy) for college students at college entry subsequently differed according to students' religious backgrounds; Catholics & Protestant fundamentalists were more stereotypic than other Protestants or Jews & were also more traditional value-oriented; Jewish students were more emergent in their values. (L&D,1;T&M)				
COGNITIVE **Kinds Of Learning**			Differences in the relative levels of information an individual displayed often reflected his patterns of interests more than his abilities. (TAL)	The average high school student did not solve simple reasoning problems as well as he memorized simple rules (e.g. capitalization) & applied them. (TAL)		
			Facts had greatest appeal for grade- & career-oriented students; ideas had greatest appeal for intellectually oriented students. (K)	In almost every case, grade 9 ability in a particular area made a very substantial contribution to grade 12 ability in the same area. (TAL)		

COGNITIVE-INTELLECTUAL DEVELOPMENT

PERSONAL CHARACTERISTICS

VOCATIONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Interests, Orientation & Experiences		As a group, those who entered employment compared to those who persisted in college showed less interest in intellectual inquiry, less intellectual & aesthetic orientation, less tolerance for ambiguity, were less interested in reflective thought, less autonomous & less socially mature. (T&M)			The correlation between males' IQ & occupational level was .69 to .75; males were achieving in accord with their mental abilities. For females, the correlation between IQ & occupational level was low (only 1/3 of the females tested were employed). Females' achievement, however, was little related to their potential abilities. (M)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Socioeconomic Status (SES)	There was a positive relationship between interest in mathematics & fathers' occupational status. (H)	At college entry, students' critical thinking ability, values & attitudes differed according to their fathers' occupations. Males & females with fathers high on the continuum of occupational levels were more emergent in values, less stereotypic & less dogmatic. (IAD,1)		Changes in mental test scores tended to be positively correlated with parents' level of SES & education. (M)	Differences in the mean growth of Negroes & Caucasians may be a function of family background: parents of Caucasians had more schooling & were working in higher status occupations than parents of Negro students. (Hi1)	
		There was a positive relationship between SES & positive self-concept about academic ability. (B)		There was a relationship between quality & cost of housing & abstract reasoning scores. (TAL)	The primary way in which SES factors operated in affecting achievement scores during high school was by affecting certain behaviors (e.g. choice of an academic or non-academic program, choice of courses & planning for college) which, in turn, had a more direct effect on test scores. (TAL)	
				There was a positive relationship between SES & academic aptitude. (B; TAL;T&M)	The direct effects of SES background on cognitive & affective achievement developed before grade 9. (TAL)	
				On the basis of test batteries administered in grades 9 & 12, the verbal factor was the closest to a general factor which was commonly called "general verbal intelligence" or "academic aptitude". This factor was the only one that had a high correlation with SES. (TAL)		
				High SES students had higher mathematics scores than low SES students when school program was held constant. (H)		

COGNITIVE-INTELLECTUAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Place of Parents' Birth		There were no significant differences in critical thinking, values & attitudes between students whose parents were born in the U.S.A. & those whose parents were foreign born. (L&D,1)				

COGNITIVE-INTELLECTUAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Educational Level of Parents		At college entry, students' critical thinking ability, values, & attitudes differed according to the level of their fathers' education. Students whose parents had a high level of education were less stereotypic, less dogmatic & had lower traditional-value orientation. For females, there was no difference in critical thinking ability by fathers' occupation; for males, higher critical thinking scores were associated with a higher level of fathers' education. (L&D,1)		Male children showed greater mental acceleration than female children when there was parental satisfaction with fathers' occupation. Changes in mental test scores tended to be positively correlated with parents' level of education & SES; this increasing parent-child resemblance was also similar for children reared by foster parents. Paternal education was correlated higher than maternal education with daughters' IQ at all ages. There was a higher correlation between mothers' education & sons' IQ than fathers' education & sons' IQ. (M) Students whose parents had a high level of education had higher general academic aptitude scores than students whose parents had less education. (L&D;TAL;SCOPE)	Parental educational level was highly associated with intellectual competence & achievement in adults. (K&M)	
Size of Family				There was a negative relationship between number of siblings & level of intelligence; respondents with one sibling had the highest intelligence test scores; as the number of siblings increased, the mean intelligence scores decreased. (B)		

COGNITIVE-INTELLECTUAL DEVELOPMENT

FAMILY CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Psychological Environment of the Home		Male high school students who had positive family relations compared to those with low or negative family relations tended to have more positive attitudes toward school. (B) The grade-oriented students compared to the vocationally oriented or intellectually oriented students were the most immature and most tied to their parents. (K)		A female's IQ was related more to parental ability; a males IQ was related more to early maternal behaviors. Males whose mothers were loving when they were age one had low test scores while males whose mothers were hostile & rejecting had high scores. Females showed opposite correlations. Between ages 5 & 18, males with loving mothers had higher IQ scores than those with hostile mothers. The closeness of the mother-son relationship was most predictive of males' verbal IQ test performance between the ages of 8 & 18. Verbal competency of the male was facilitated by a close relationship to the mother in the early pre-school period. Fathers' friendliness but not expressiveness of affection was positively related to their daughters' intelligence. Females' mental growth was accelerated in a milieu of parental harmony & lack of conflict while a males' mental development was negatively correlated with parental compatability. If the mother-daughter relationship was too close, the daughter's intelligence decelerated in later childhood. The physical status of parents & parents' social adjustment did not significantly correlate with their children's cognitive development. (M)	Given undamaged genetic potential, mental growth was best facilitated by a supportive, warm, emotional environment together with ample opportunities for positive reinforcements of specific cognitive efforts & successes starting with the first three years of a child's life. (M) Child & adult intellectual achievement for males was highly correlated with maternal protection during ages 0-3. Mothers' hostility toward their daughters during ages 0-3 together with mothers' urging their daughters to achieve during ages 10-14 were associated with intellectual mastery in females. (K&M)	The group of college students reporting the greatest pleasure & satisfaction in their use of the intellect also appeared free or even alientated from parents. (K)

COGNITIVE-INTELLECTUAL DEVELOPMENT

FAMILY CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Philosophy of Education in the Home				Males showed greater mental acceleration than females when their fathers were concerned with educational achievement & when there was parental satisfaction with fathers' occupations. (M)		
Financial Support for Education						

COGNITIVE-INTELLECTUAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Type of High School		At college entry, critical thinking ability of students differed according to type of high school attended. Students from public high schools were least stereotypic & dogmatic while students from parochial high schools were most stereotypic & dogmatic & had the highest traditional-value scores. (L&D,1)		Test score patterns of the vocational high school males indicated that although less than 10% of these students went to college, as many as 25% of them had the academic ability to enter & even graduate from college. Vocational school students achieved higher scores on mechanical information than students from urban, better class housing areas; the vocational school students, however, had the lowest scores on reading comprehension tests. (TAL)		
Size of High School & Size of Classes					The greatest achievement in mathematics was obtained by students who were in schools with enrollments exceeding 800. The size of class, however, was not related to the following school characteristics: size of senior class; drop out rate; average class size; or rural-urban status. (H) Students achievement was not related to the following school characteristics: size of senior class; drop-out rate; average class size; or rural-urban status. (TAL)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Composition of Student Body					Mathematics achievement was higher in schools which were heterogeneous in terms of students' socioeconomic status. The difference in mathematics achievement between U.S. high school males & females was greater in non-coeducational schools than it was in coeducational schools. (H) Minority students' achievement scores were higher where classmates were over 50% Caucasian. Negroes who entered integrated schools in early grades achieved higher scores on reading & mathematics tests than those who entered such schools later. (C)	Less intelligence testing was done in schools attended by Negroes & Puerto Ricans. (C)
Facilities-Resources					There was a small but consistent relationship between some school facilities (e.g. science laboratories) & students' achievements. Negroes disproportionately attended schools where these facilities were lacking. (C)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Curricula				Mental growth in high school students occurred in all areas, but the larger gains tended to be associated with specific school-taught subjects rather than general area of knowledge. (TAL)	Foreign language courses taken had no effect on English test performance or on the memory for words test. (TAL)	Caucasian students had more access to fully developed programs, college preparatory programs & extra curricular activities related to academic matters (e.g. debate teams & newspapers). (C)

COGNITIVE-INTELLECTUAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Influence of Teachers & Counselors					The quality of teachers showed a strong relationship to student achievement, particularly for minority students, although ultimately the school experience had relatively little impact on student achievement. (C) The amount of counseling a student received in high school appeared to have little effect on test score gains after initial ability & SES were taken into account. (TAL)	
Influence of Peers					Students' achievement, particularly minority students', were strongly related to the educational background & aspirations of other students in the school. Minority children attended schools where peers had less educated parents, were from larger families, reported less books in the home & where the dropout rate was greater than schools with predominately Caucasian enrollments. (C)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

HIGH SCHOOL CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Academic & Non-academic Experiences			The amount of formal training or informal exposure in high school (even if not sought) played some part in determining the amount of information a student acquired in an area. (TAL)	Negroes attended schools with less favorable academic environments measured in terms of overall grade average & scores on intelligence tests than did Caucasians.	Student achievement was predictable to a high degree for most subjects from ability plus amount of exposure to experiences related to the subject matter, The most important predictors of English achievement were: being in an academic curriculum rather than a vocational high school; having well paid & experienced teachers; having an adequate library; having study halls; & having considerable homework. (TAL)	Caucasian students had more access than minority students to fully developed programs; college preparatory programs & extra-curricular activities related to academic matters (e.g. debate teams & school newspapers). (C)
Persistence/ withdrawal			High school males & females gained in abstract reasoning over a four-year period. (TAL)		Between grades 9 & 12, variability in achievement & aptitude scores was greater within grades than between grades. (TAL)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

COLLEGE CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
College vs. No college	Compared to employed youth, more college persisters reported having browsed in bookstores; attending theater, concerts and art exhibits; liking classical music & being interested in intellectual rather than "practical" professions. (T&M)			Academic aptitude & SES were significantly related to the type of training a student entered into after high school (e.g., armed forces, technical school, nursing school, 2 or 4 year college). (TAL;T&M)		

COGNITIVE-INTELLECTUAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Type of college	Coeducational liberal arts colleges had a positive effect on student's interest in obtaining a doctorate; northeastern men's colleges produced significantly fewer students who aspired to the Ph.d. than would be expected on the basis of their input. (A)	Institutions which attracted the most intellectually disposed students were the independent universities; the vocational schools attracted those in the lowest quartile. (SCOPE) On the basis of a select & small sample, there were only slight differences in critical thinking, values & attitudes among students attending 2 small midwestern colleges & those attending a large university. Students at the large university did have significantly higher critical thinking scores than students at small church-related colleges. When critical thinking was controlled, the only significant difference was the stereotypy score for males. There was a significant difference between the three schools on the test of religious beliefs for women only. (L&D,1)				
Size of College & Size of Classes						

COGNITIVE-INTELLECTUAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Composition of Student Body						
Facilities & Resources					When student inputs were controlled, institutional quality as traditionally defined did not appear to have an effect on student's intellectual achievement. (A&P)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

COLLEGE CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Curricula, Major Fields		At college entry, students' critical thinking ability, values & attitudes differed according to major field of study; females in non-technical curricula such as social sciences, humanities & communication arts were less stereotypic & less dogmatic than females in vocationally oriented curricula. There were more marked differences between males in different curricula than between females. Those scoring high in the cognitive area tended to exhibit less stereotypic beliefs, less dogmatism & be less oriented toward traditional values. There were some significant differences between males who remained in their majors & those who changed majors. Those students who changed majors & had a low grade point average were the most dogmatic & stereotypic. The non-changers, however, had the highest mean traditional-value score. For females, there were no significant differences in stereotypy or dogmatism between the changers & non-changers. Female changers with low grade point averages had the highest traditional-value scores. (L&D,1) Vocational orientation may have been the strongest influence working against the liberalizing effects of the curriculum; it constricted students' exploring various educational & occupational preferences & goals. (K)	If student and course objectives were not appropriately matched, the possibility increased that students would be frustrated and lose interest in learning and thereby resort to rote memory work only in place of growth in learning. (K)		Males at one select university claiming an intellectual orientation to the curriculum had the lowest grade point average of all groups but not at a second select comparison university; the grade-oriented males had the highest grade point averages at both universities. (K)	

COGNITIVE-INTELLECTUAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Influence of Teachers, Faculty Characteristics						
Influence of Peers						
Academic & Non-Academic Experiences						

COGNITIVE-INTELLECTUAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Persistence/ Withdrawal	**The greatest increase in expressed interest in graduate school occurred in the last two years of undergraduate work. (T)**	Senior questionnaire data suggested that personal growth was more valued by students than intellectual growth. (K)				
		More seniors than freshmen felt it was important to acquire a liberal education rather than a vocational education. (L&D,1;T&M)				
		College persisters compared to withdrawals and even more to non-attenders were more intellectual, self-reliant and open-minded before entering college and even more intellectually oriented and autonomous after 4 years. (T&M)				
		There was a significant difference in critical thinking, values & attitudes between those who completed the freshman year & those who withdrew. Those who completed the freshman year had significantly higher scores on the Inventory of Beliefs than those who withdrew. There were no significant differences in dogmatism or traditional-value orientation scores between the first year persisters and withdrawals. (L&D,1)				
		There were significant differences in critical thinking, values & attitudes from freshman year to sophomore, from freshman to senior, from sophomore to junior & junior year to senior. Both males & females scored higher on the Inventory of Beliefs, critical thinking, as seniors than as freshman & lower on traditional values & dogmatism. The greatest changes, however, took place in the first two years of college. The				

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Persistence/ Withdrawal		major changes in critical thinking, however, appeared to occur in the freshman year: students who completed the freshman year also had significantly higher scores on tests of reading ability, academic aptitude and critical thinking ability than those who withdrew. There were less, but some, positive changes at the end of the sophomore and senior years, but no gains were noted for juniors. (L&D,1&2) For both university persisters & withdrawals of both sexes, there was no significant relationship between changes in attitudes & values & academic aptitude. Persisters and withdrawals reported that they had become more flexible, less authoritarian, more open-minded & understanding about others, changed their ideas about behavior standards, were more able to define their life goals, became more assured of their ability to handle new problems, started to question moral & religious absolutes & became more interested in world events. There were significant differences between persisters & withdrawals at different time periods & between the sexes in degree of self-perceived changes. In all of the following areas, the more college attended, the greater the increase in: tolerance of people of different races or beliefs; insight into others; interest in social, intellectual, & cultural affairs; critical reasoning (for males only); responsibility for behavior; belief in the importance of a liberal arts education; & pessimism regarding the future of civilization. Similarly, as subjects completed more college,			

COGNITIVE-INTELLECTUAL DEVELOPMENT

COLLEGE CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Persistence/ Withdrawal		there was a progressive decrease in: acceptance & adherence to a religious affiliation, & respect for rules. A sizable number of respondents, however, did not feel that any major changes had occurred in their attitudes, values or interests. (L&D,2;T&M)				

COGNITIVE-INTELLECTUAL DEVELOPMENT

COMMUNITY CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Region				By 12th grade, both Caucasian & Negro students scored below their counterparts in the North on tests of verbal and non-verbal skills. Southern Negroes also scored below Southern & Northern Caucasians. (C)	Regional differences in achievement were noticeable. Students in the Northeast tended to be above the national average & students in the Southeast below that average. Differences within each region, however, were more striking. (TAL)	More Negroes & Caucasians in the Metropolitan Far West attended schools with a remedial reading teacher than did students in Metropolitan South & Non-Metropolitan Southwest. (C)
Urban/ rural		At college entry, student's critical thinking ability differed according to student's community background. Males who lived most of their life on a farm were more stereotypic, dogmatic & traditional value-oriented. For females, there were no significant differences except that those who lived most of their life on a farm were more traditional value-oriented. (L&D,1)				

COGNITIVE-INTELLECTUAL DEVELOPMENT

COMMUNITY CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Socioeconomic Status (SES)						
Higher Education Resources						

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex	There were more items for males than for females on which self-ratings were higher for friends than for those at home. Girls find as much opportunity in the home as they do with friends for exploration of adult-oriented roles; boys need additional opportunities with their friends. (SCOPE)	Males, both college & non-college, were less religious than were women. (T&M) Females reported having more conflict regarding sex, but also a greater degree of acceptance of sexual intimacy. Females also reported more meaningful relationships with members of the same and the opposite sex than did men. About half of the males & females agreed that the husband should control the wife; the other half were neutral or undecided. The majority (82%) of the females reported that they would prefer their husbands to have the decision-making priority; 60% of the males reported they would prefer to have that priority. (K) At college entry, males compared to females were significantly more stereotypic and dogmatic, placed more emphasis on theoretical, political and economic values, and were more oriented toward emergent values. Females had higher academic aptitude scores, were better readers, placed more emphasis on esthetic, social and religious values, and were more oriented toward traditional values. (L&D,1) With few exceptions, persisters and withdrawals of both sexes showed an increase over a 4-year period in critical thinking ability, a trend towards traditional values, a decrease in stereotypic beliefs, dogmatism, authoritarianism & unreceptivity to new ides. Persisting (cont.)		There was a significant relationship between the avoidance of sports & traditional masculine behavior & passivity in boys during the first three years. For males, failure to adopt masculine behavior during ages 1-6 was predictive of adult high sex anxiety. For girls, sex-role interests were not highly related to adult sexual anxiety. (K&M) Sex differences were reflected in the total number of behavior problems in school children. (M) High school girls were better behaved & better mannered, more sensitive, more sociable & took their school assignments more seriously than high-school boys. (TALENT)		

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex (cont.)		males moved more toward emergent values than did the male withdrawals all of whom moved toward an increasing orientation toward traditional values. The less college attended, the greater the movement toward traditional values. For females, however, only freshmen withdrawals became more traditional in their value orientation; for the rest of the females, the more school completed, the more oriented they became to emergent values. There were no significant differences between persisters & withdrawals or between sexes with respect to degree of change in dogmatism. All groups became less dogmatic. Regardless of time spent in college, there was a decrease in stereotypic thinking. Only for the females were there significant differences between persisters & withdrawals when degree of change was considered: the longer a female stayed in college the less she adhered to stereotypic beliefs. More females than males reported that after 4 years they had come to respect views contrary to their own. However, only for males was the amount of college attended significantly related to an increase in this self-reported change. For women only, there was a direct positive relationship between amount of college & increase in: tolerance of nonconformist dress or behavior, interest in politics & scientific developments, conviction that an individual can determine the quality of education received more than the institution, & the perceived importance of money. (cont.)				

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Sex (cont.)		Also, the more college attended, the less a female indicated a respect for persons in authority. Only males felt they had increased in their critical reasoning abilities. (L&D,2) Females who entered homemaking immediately after high school changed the least & generally regressed in intellectual disposition & autonomy compared to their employed peers & particularly their college-attending peers. As measured by the non-authoritarianism scale (OPI) college women showed the greatest growth in autonomy. (T&M)				
Race	Minority students in high school, except Orientals, had far less conviction than Caucasians that they could affect their own environments & control their future. (C)	Minority students in high school, except Orientals, had far less conviction than Caucasians that they could affect their own environments & control their future. (C)				
Academic Aptitude, Intelligence & Grade Point Average	Males with high scores on intelligence tests compared to males with low scores tended to have positive self-concepts of their academic ability. (B) Although there was no significant relationship between scholastic performance & traditional-value orientation, there was a significant relationship between scholastic performance & stereotypic beliefs & dogmatism. (L&D,1)	Although there was no significant relationship between scholastic performance & traditional-value orientation, there was a significant relationship between scholastic performance & stereotypic beliefs & dogmatism. (L&D,1)	Males with high scores on intelligence tests compared to males with low scores tended to have a higher level of political knowledge. (B)		Achievement behavior & intellectual mastery during childhood & adulthood were highly correlated with IQ for both males & females. (K&M)	

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Early Childhood Behaviors	Adult need for status & social recognition were significantly related to achievement behavior in childhood. For females, passivity & dependency during ages 6-14 were associated with passive & dependent relationships with their love object (husband or boyfriend), dependency on their parents, withdrawal as adult women & minimal conflict over dependency as adults. (K&M)	Intellectual orientation as adults was significantly related to strong fear of bodily harm during 3-6 for males. For females, there was a negative correlation between avoidance of dangerous activity during age 6-10 & intellectual orientation. (K&M)		Passivity during the first three years was significantly associated with a consistent cluster of school age behaviors (ages 6 to 10); avoidance of dangerous activity, absence of physical & verbal aggression, conformity to parents & timidity in social situations. Males who were passive during the first three years avoided sports & traditional masculine activities; were non-competitive, avoided sexual behavior & were apprehensive in social situations. Inhibition & apprehension with peers during early childhood was predictive of social anxiety behavior in adulthood. For males aggressive behavior & competiveness in adulthood was associated with aggressive behavior to mother, behavioral disorganization & dominance between ages 10-14. Adult male competitiveness was also associated with both indirect & direct physical aggression to peers during childhood. For women there was a negative relationship between peer aggression in childhood & adult aggressive behavior. For females, only childhood competitiveness predicted adult competitive behavior. For both males & females, adult behaviors of aggression anxiety were predicted by absence of aggression to mother & a high degree of conformity during ages 6-10. Achievement behavior in childhood was significantly related to withdrawal & fear of failure in childhood. (K&M)	Achievement, intellectual mastery & competence as adults were significantly related to achievement behavior during childhood. (K&M)	

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Age						
Personality Characteristics & Dispositions	A student typology revealed students to be within three classes according to their orientation to college & the curriculum: for grades, career preparation, or intellectual interests. For all freshmen groups, Social Maturity scores were highest for students who were intellectually oriented. (K)	There was a tendency for high school students who felt that a college education was necessary for the kind of work they wanted to do to have higher than average scores on the culture, leadership and mature personality scales. (TAL) College students who were most concerned about preparation for a career were the most practical both as freshmen & as seniors. (K) Political attitudes were a function of personality traits--there was a significant positive correlation between conservatism in political attitudes & authoritarianism. However, females who were negativistic (opposed to) the community norms but aware of their negativism changed in a more liberal direction in contrast to females who were negativistic but unaware of their negativism. (N)		Among males, the Social Sensitivity, Calmness, Self Confidence, & Mature Personality scales tended to have higher correlations with achievement & aptitude scores than did the other scales. Among females, most of the significant correlations between scores on personality scales & cognitive tests pertained to scores derived from the Mature Personality scales, the Culture scale, & the Social Sensitivity scales. (TAL) Males with high scores on intelligence tests compared to males with low scores tended to have a positive self-concept about their school ability. (B)	Persisters tended to be more intellectual, self-reliant & open-minded before entering college & even more intellectually oriented & autonomous after 4 years compared to peers who withdrew from college & particularly those who did not attend college. Persisters compared to withdrawals or non-attenders showed significantly greater esthetic appreciation, greater positive change in autonomy, greater tendency towards reflective thought, tolerance for ambiguity, intellectual orientation, interest in cultural activities (e.g., preference for classical music) & were less religious in orientation. (T&M) High aptitude non-attenders compared to their college-going peers exhibited a greater lack of self-confidence, apathy, pessimism & alienation; fewer were convinced they had the ability to do college work. (SCOPE)	

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL/ INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Psychological Adjustment & Maturity	The most important change in college was the differentiation of self from parents, especially fathers. And the differentiation of self from parents seemed to manifest itself in the realization that the student did not really want to do what he always thought he would do. (K)	Choosing between going to college to develop a philosophy of life versus preparing for a job was not an immediate concern of high school seniors--they had dealt with this problem earlier or expected to deal with it in the future. (SCOPE) University senior questionnaire data indicated that students felt more stable than they did as freshmen, showed more self-understanding, self-satisfaction, self-criticism, more emotional control, ability to face limitations & a better defined philosophy & set of interests. (K) In addition, 42% of the seniors said it was much easier to "feel close" to people as seniors than as freshmen; 20% said it was more difficult. (K)	Students tended to dichotomize their pasts as reminiscence & the present in terms of reasoning (independent of their past experiences) & failed to recognize the importance of their histories in determining their present attitudes & behaviors. (K)	Struggles of extraction from the "child self" and/or parents' aspirations caused depression & sadness in college students which were perceived by the researchers as positive signs of growth. Identity crises, however, were not as dramatic as expected & were usually not resolved by college graduation. One form of identity shock may be called "background shock" & is the student's realization for the first time that he has serious background deficiences compared to other students (e.g., he is not first anymore, in academic, social, or athletic competition. Most students had difficulty in coping with anger & hostility. Most reported an inadequate model as their parents were generally not open about negative expression. No evidence was found to support the popular stereotype of widespread sexual promiscuity on campus; rather, most physical intimacy was expressed through serious relationships. (K)	Students who did not go to college exhibited a lack of self-confidence, apathy & resentment. They were resentful & frustrated by their school programs & unresponsive to help from school personnel. They were alienated from themselves & from the American way of life. (SCOPE) The pupil attitude factor which bore a stronger relationship to achievement than all the school factors together was the extent to which an individual felt that he has some control over his own destiny. (C)	

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

PERSONAL INTERPERSONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Educational Aspirations, Motivations & Interests	In general, educational aspirations were positively related to the extent to which the following were problems: 1) deciding upon a college major 2) finding out which college best suits one's interests & abilities 3) deciding what to do if rejected by one's first choice college. (SCOPE)	Students who desired more education tended to be less dogmatic, less stereotypic & more emergent in their values than students who aspired to 4-years of college or less. (L&D,1)	Differences in the relative levels of information that an individual displays often reflect his pattern of interests more than his patterns of abilities. (TAL)		Lack of ambition was a key characteristic of high aptitude students who did not attend college. (SCOPE)	
MISCELLANEOUS **Marital Status**						

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Social/ Political		Change in the direction of acceptance of community norms was greater among students whose reference groups were accepting of community norms. Increases in tolerance & unconventionality were more frequent among those initially incongruent in their social attitudes than among those initially congruent, but increases in individualism & intellectualism were more frequent among students initially congruent in their social attitudes than among those initially incongruent. Changes in social attitudes, particularly the experience of questioning one's initial attitude & the relationship with one's peers were a function of experience in college. Change in the direction of acceptance of community social norms was greater among students who questioned their values than among those who did not; the relationship between questioning & change toward community norms was greater for students initially incongruent in their views than for those initially congruent. (N) Political attitudes developed in college persisted over time--but there was no significant relationship between change of political attitudes during college & persistence of attitude after college. Persistence of political attitudes was a function of environmental support i.e., women whose post-college environment was supportive of--congruent with--their political attitude developed in college showed higher persistence of attitude than women			Less than 1/3 of the males & 1/2 of the females reported much change in their political views after entering college. (K)	

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Social/ Political (cont.)	Although the extent to which personal-social issues were perceived as problems was not highly related to educational aspirations, the extent to which one's political stand was a problem was so related. The higher the educational aspiration, the greater the concern. (SCOPE)	whose post-college environment was incongruent with college attitudes. Persistence of political attitudes after college was also a function of personal orientation toward the collegiate community norms--that is, among conservative women, those who were aware of their incongruence with the prevailing community norms & who were not negativistic or opposed to these norms were most likely to change toward liberal attitudes after college. Those who were unaware & negativistic were least likely to change. (N)				
Cultural/ Aesthetic				Freshman females who changed their majors reported a significant relationship between changes and cultural activities. Those who were more emergent than traditional value-oriented indicated cultural activities had an impact on their behavior. (L&D,1)		

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

SPIRITUAL RELIGIOUS, HUMANISTIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Attitudes, Orientations & Experiences	**There was an inverse relationship between concern about one's stand on religion & educational aspirations. Those with less extensive aspirations were more concerned about their stand on religion. (SCOPE)**	Catholics were more stereotypic in their beliefs than Protestants or Jews & were also more traditional value oriented. Jewish students were more emergent in their values. (L&D,1;T&M)				
		College students' self-reported changes indicated that some students became more attached to a religion & its beliefs; some became less so. There was no decrease in the numbers of students who reported less need for religion. (L&D,1)				
		The greatest negative change in intellectual disposition & autonomy during the first four years after high school occurred among Protestant Fundamentalists & Catholics compared to other groups. (T&M)				
		Less than 1/3 of the males and 1/2 of the females reported much change in their moral or religious views after entering college. (K)				
COGNITIVE Kinds of Learning						

PERSONAL DEVELOPMENT

PERSONAL CHARACTERISTICS

VOCATIONAL	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Interests, Orientations & Experiences						

PERSONAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Socioeconomic Status (SES)		Males from high SES homes compared to males from low SES homes tended to have more positive feelings of self-concept of their academic ability. (B;T&M) For students of low & low-mid SES, there was a direct positive relationship between concern about being rejected by the college of choice & educational aspirations. Students of mid-high SES with baccalaureate aspirations were very concerned about their choice of major. (SCOPE) Students whose parents were high on the continuum of occupational levels were more emergent in their values, less stereotypic & less dogmatic. (L&D,1)				
Place of Parents' Birth		There were no significant differences in critical thinking, values & attitudes between students whose parents were born in this country & those whose parents were foreign born. (L&D,1)				

PERSONAL DEVELOPMENT

FAMILY CHARACTERISTICS

DEMOGRAPHIC	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIORS	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Educational Level of Parents	Adult dependency in males was significantly associated with maternal education & dependency on love object; for females, paternal educational level was inversely related to love-object dependency. There was no relationship, however, between education of parents & passivity & dependency in childhood. (K&M)	Students whose parents had a high level of education were less stereotypic and dogmatic & had lower traditional value scores. (L&D,1)			Adult intellectual competence & general achievement were highly correlated with the level of parents' education. (K&M)	
Size of Family						

PERSONAL DEVELOPMENT

FAMILY CHARACTERISTICS

PROCESS	NEEDS-MOTIVES-INTEREST	ATTITUDES-VALUES-FEELINGS-BELIEFS	AWARENESS-KNOWLEDGE-UNDERSTANDING	ABILITIES-SKILLS-BEHAVIOR	ACHIEVEMENT	SATISFACTION & OPPORTUNITIES
Psychological Environment of the Home	High school males having positive family relationships compared to males having more negative family relationships tended to have a higher need for social approval, higher vocational aspirations & exhibited lower impulse to aggression. (B)	Males having positive family relationships compared to males having low or negative family relationships tended to have more positive attitudes toward school & a high level of self-esteem & positive social values (e.g., kindness, generosity, self-control, responsibility.) (B) Few college students proposed a life-style different from their parents in spite of the rebelliousness associated with autonomy. However, closeness of family relationships was not a determinant of shared values & attitudes. (K)		Certain maternal practices during a child's first three years were more sensitive indices of the child's pre-adolescent & adult behavior than evaluations of similar parental practices in later childhood. (K&M) Males having positive family relationships compared to males having low or negative family relationships tended to have fewer somatic symptoms and a lower incidence of both delinquent & rebellious behaviors. (B) Most students had difficulty coping with anger & hostility. Most reported an inadequate model as their parents were generally not open about negative expression. (K)	Maternal protection of boys during age 0-3 was highly correlated with child & adult intellectual achievement; for females, maternal hostility during age 0-3 together with maternal acceleration during age 10-14 were associated with adult intellectual achievement in women. (K&M) Students who do not go to college have less positive identification with Father than students who go for a short time. Non-attending girls, more than short-term girls, tended to retreat from a positive identification with mother. (SCOPE) More persisters than withdrawals or non-attenders reported their parents as "loving," having supportive temperaments & encouraging them to go to college. (T&M)	Males having positive family relationships compared to males having low or negative family relationships tended to have a higher degree of reported happiness. (B) The group of college students reporting the greatest pleasure & satisfaction in their use of intellect also appeared free or even alienated from parents. (K)
Philosophy of Education in the Home		Lack of parental encouragement in the pursuit of educational goals was accompanied by a deep sense of alienation between a student & his parents, particularly father. (SCOPE)				